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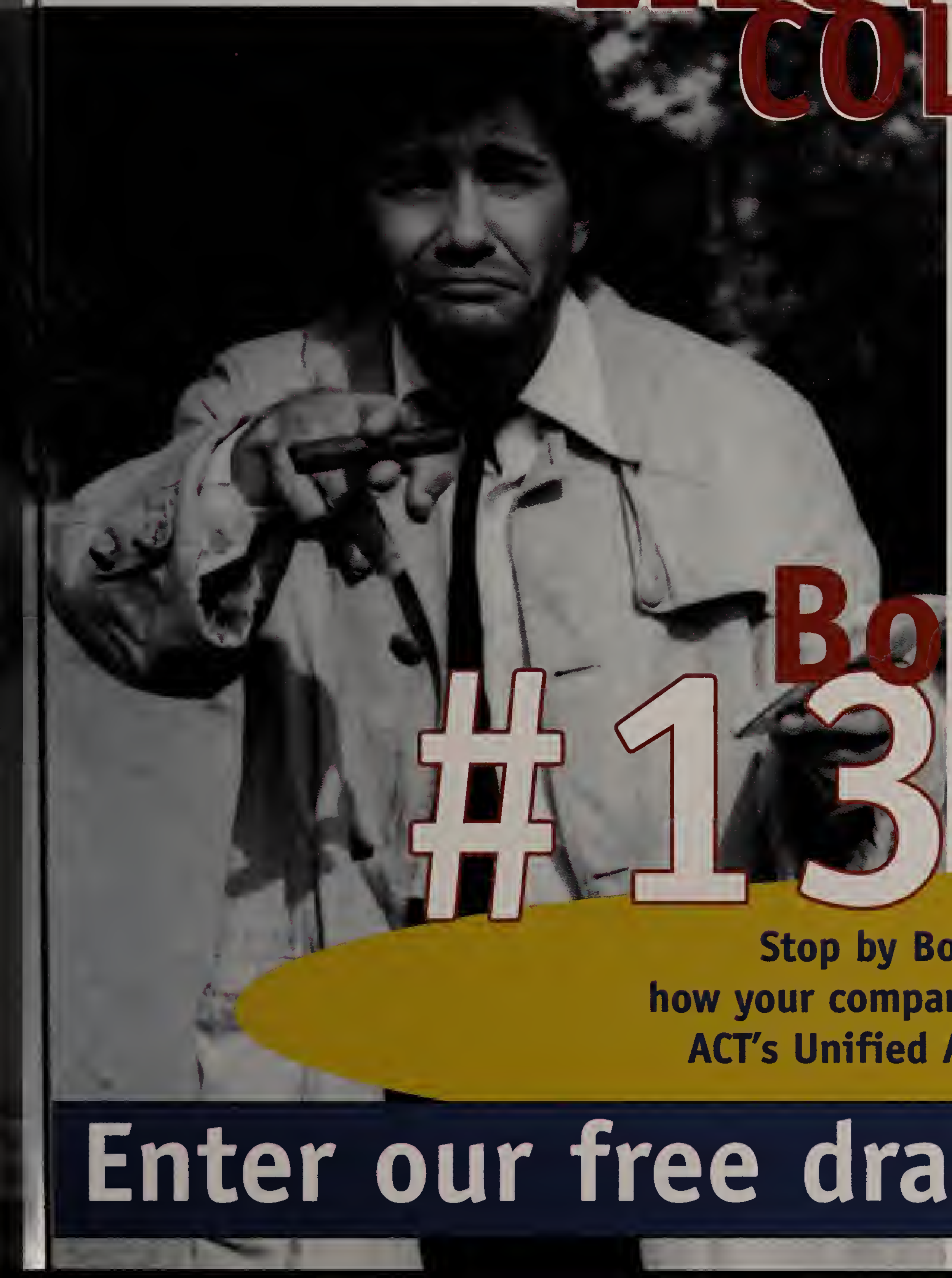

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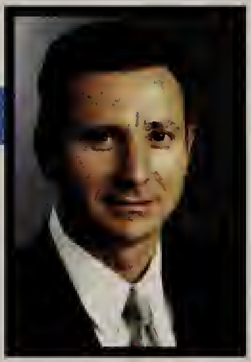

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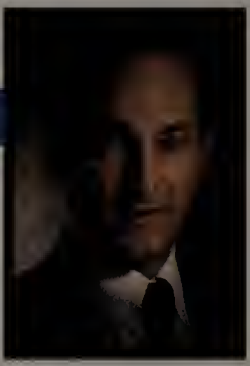
Hypercom Network Systems is enabling companies with medium to large branch networks to consolidate multiservice traffic onto a single, cost-effective network. By integrating legacy and LAN data, fax, voice and video, users of Hypercom's Integrated Enterprise Network access devices can drastically cut costs, prepare for the future and streamline management. Hypercom makes complex networking simple.

All efforts have been made to make this listing as complete and accurate as possible. Network World *is not liable for errors or omissions.*



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SVP Systems Business Unit
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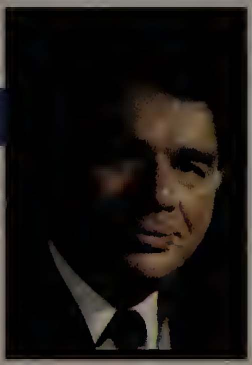

Henry Epstein

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Memotec Communications, Inc.

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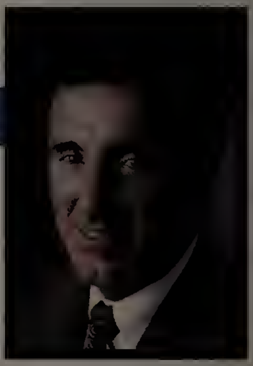

Don Reed

President and CEO
Cabletron

Led by President and CEO Don Reed, Cabletron Systems is a world-renowned developer, manufacturer and marketer of standards-based LAN, WAN and ATM networking solutions. Through its advanced switching and enterprise management products, coupled with strategic industry partnerships, Cabletron provides the infrastructure to seamlessly support voice, video and data resources from one integrated platform. The result: simple, reliable, cost-effective solutions for a better way to work.

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JANUARY 26, 1998 VOLUME 15, NUMBER 4

NetworkWorld

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GIGABIT ETHERNET BACKBONE SWITCHES
GUIDE

INTRANet
Stream on
From audio to 3-D images, bits fly across intranets

ALSO INSIDE:
- Remote intranet access
- Keeping images lean
- Comparative review: Client-to-LAN VPN products

STEIN LOKEN

'Net gets ATM lift

WorldCom hopes to ease Internet congestion with third major Metropolitan Area Exchange.

By Denise Pappalardo and Sandra Gittlen
Washington, D.C.

An overburdened Internet will get some welcome relief at this week's ComNet '98 show when WorldCom, Inc. announces it is building a third major Metropolitan Area Exchange (MAE).

MAE-Central, which MAE proprietor WorldCom is building in Dallas, will help ensure that Internet traffic passes from one Internet service provider to another safely and with some measure of speed. WorldCom inherited oversight of the MAEs when it acquired MFS Communications Co. more than one year ago.

This Tier 1 MAE will be WorldCom's first exchange based solely on Cisco Systems, Inc.'s StrataCom BPX ATM switches. WorldCom is buying 16 BPX switches for its three MAEs.

WorldCom's other two Tier 1 MAEs, MAE-East and MAE-West, primarily use Digital Equipment Corp.'s FDDI GIGAswitches. But FDDI, by most ISP standards, has fallen short on

See **MAE,** ***page 16***

MORE SHOW COVERAGE INSIDE

COMNET

- WorldCom to launch end-to-end frame relay service. Page 6.
- 3Com, Foundry and FlowWise to turn on new switches. Page 8.
- Neo Networks to rev up massive router. Page 8.
- Microsoft, Intel, Compaq and regional telcos to make DSL show of strength. Page 14.
- ACT Networks gateway switch to merge voice and data traffic. Page 25.

MFS founder plots big IP net

By Tim Greene
Omaha, Neb.

Level 3 Communications, Inc. is betting billions that when it comes to delivering data, voice, and video IP is it.

While the industry at large is still trying to figure out what it will mean long-term, the group of veterans at this start-up says there is just one network for the future — the Internet.

Level 3 promises to offer IP data services in six cities this year, expanding to 60 cities by 2001. Voice and video services, as well as quality-of-service (QOS)

See **Level 3,** ***page 16***

Is Netscape giveaway genius or desperation?

By Andy Eddy
Mountain View, Calif.

Most observers expected Netscape Communications Corp. to knuckle under and give its browser away for free, but few imagined that it also would give away the store.

Late last week, Netscape announced that effective immediately its Navigator browser and Communicator client suite will be distributed free of charge. Additionally, the company's Unlimited Distribution program enables PC makers, Internet service providers, telephone

See **Netscape,** ***page 76***

Get more online: Reviews of Netscape and Microsoft browsers, and copies of court filings in the Microsoft vs. Department of Justice case.

www.nwfusion.com FIND IT ON FUSION 5522

Sun releases Java enterprise directory hooks

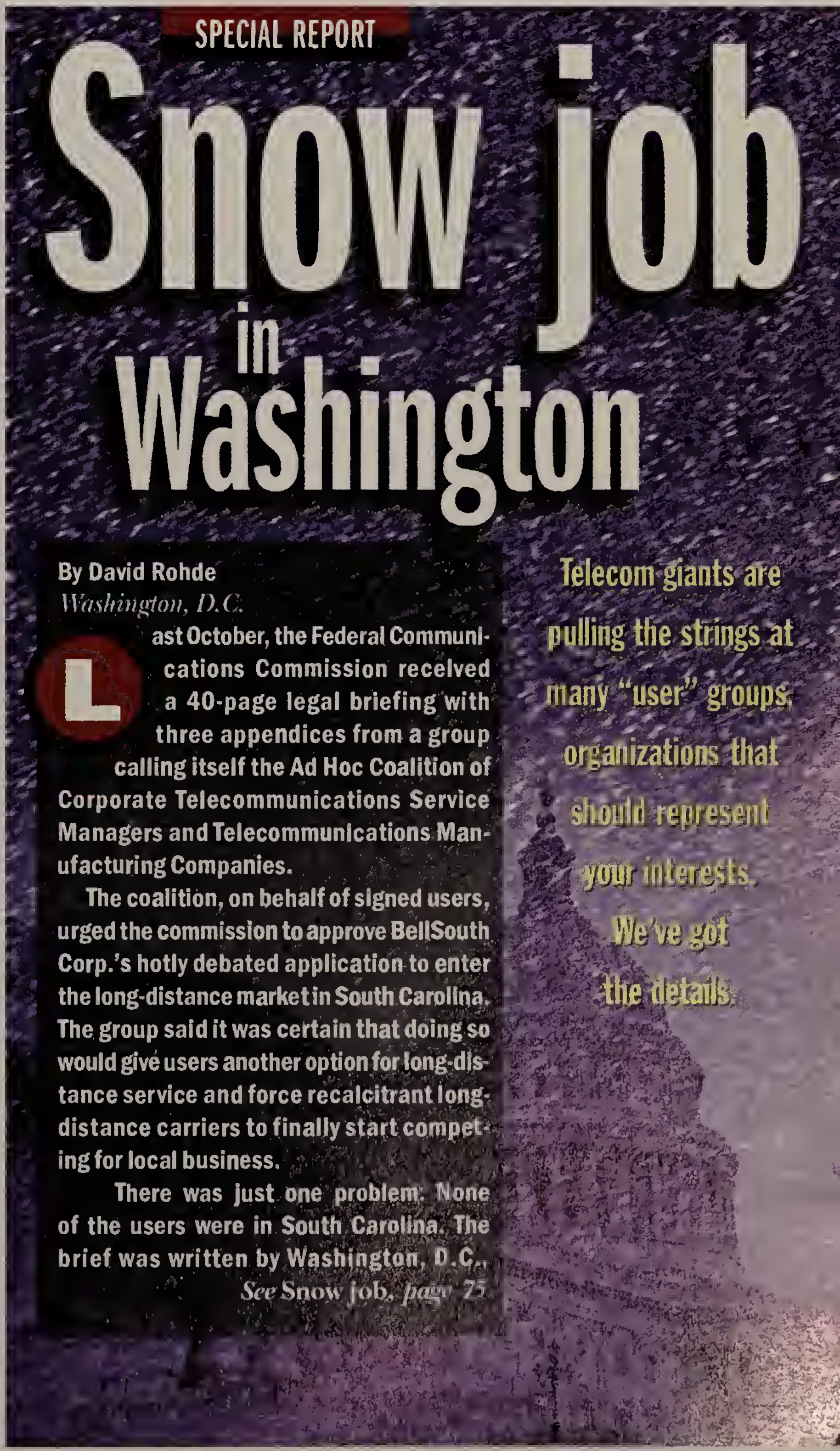
By Chris Nerney

After a delay of several months, developers this week will have a tool for building Java applications that can access multiple standard naming and directory services — a critical function for software running on legacy systems.

The Java Naming and Directory Interface (JNDI) will be posted online Friday by Sun Microsystems, Inc.'s JavaSoft division, a company official said.

But JavaSoft also said JNDI will not be integrated into the next complete version of the Java

See **JNDI,** ***page 16***



SPECIAL REPORT

Snow job in Washington

By David Rohde
Washington, D.C.

Last October, the Federal Communications Commission received a 40-page legal briefing with three appendices from a group calling itself the Ad Hoc Coalition of Corporate Telecommunications Service Managers and Telecommunications Manufacturing Companies.

The coalition, on behalf of signed users, urged the commission to approve BellSouth Corp.'s hotly debated application to enter the long-distance market in South Carolina. The group said it was certain that doing so would give users another option for long-distance service and force recalcitrant long-distance carriers to finally start competing for local business.

There was just one problem: None of the users were in South Carolina. The brief was written by Washington, D.C.,

See Snow job, *page 75*

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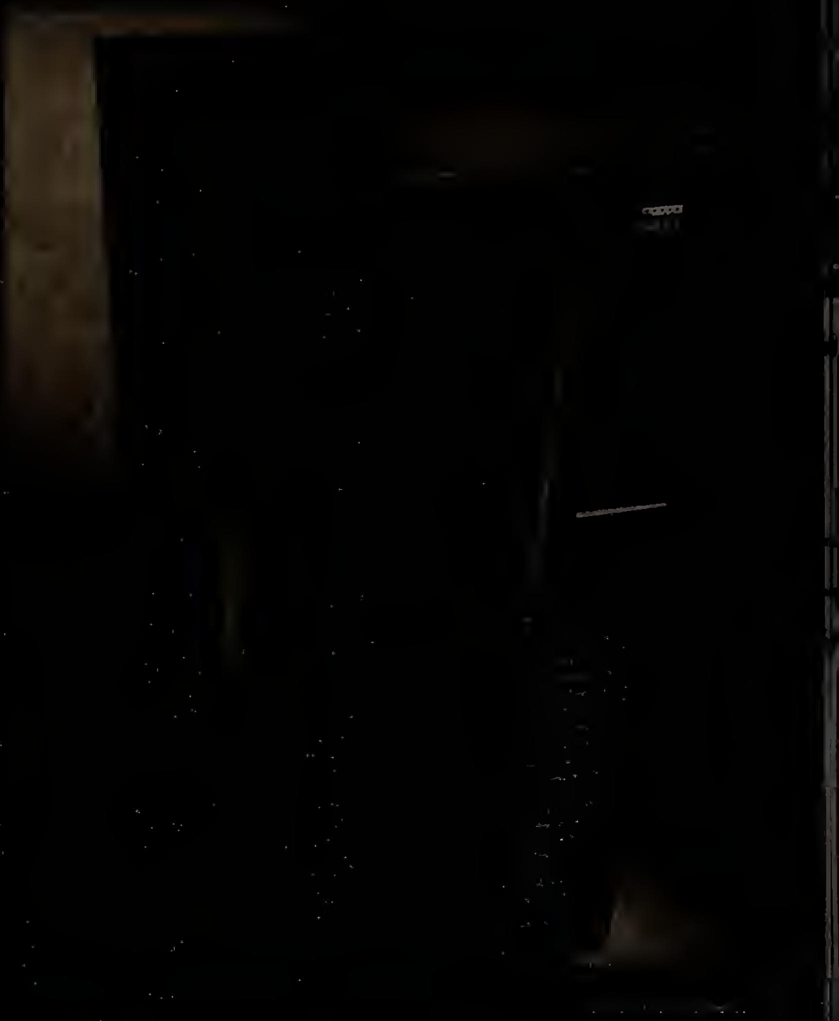

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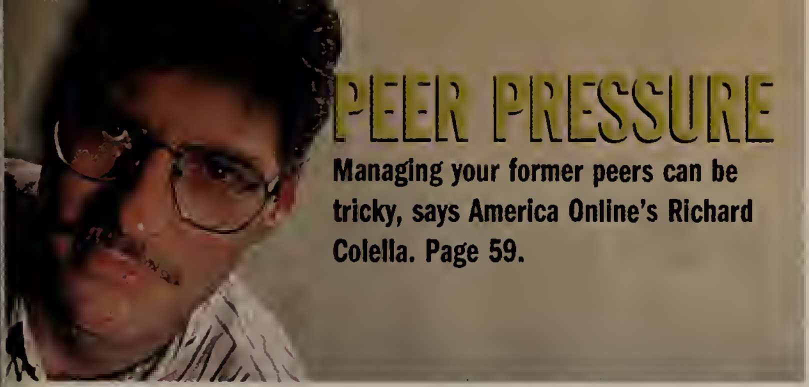


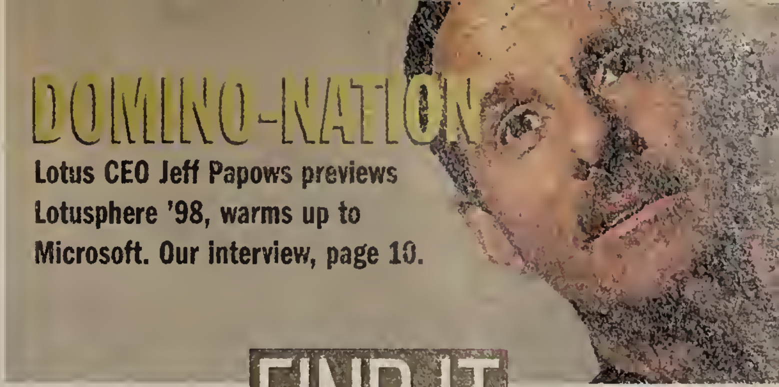
PEER PRESSURE

Managing your former peers can be tricky, says America Online's Richard Colella. Page 59.

STAN BAROUH

MASSIVE POWER

Neo Networks this week will show off its new high-powered router. Page 8.



DOMINO-NATION

Lotus CEO Jeff Papows previews Lotusphere '98, warms up to Microsoft. Our interview, page 10.

SHAWN HENRY

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January 26, 1998 Volume 15, Number 4

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Commerce choices

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GIGABIT ETHERNET BACKBONE SWITCHES

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Product Chart: *Complete specifications on 12 offerings.* **Page 51.**

THE HELP DESK'S BEST FRIEND: *Web tools help Autodesk pry personnel from the phones and promote self-help efforts.* **Page 55.**

DAVID POWERS

HEAD-TO-HEAD: *Mark Gibbs and Dave Kearns square off on whether the Justice Department is justified in going after Microsoft.* **Page 41.**

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To quickly get to any online info referenced in *Network World,* enter its DocFinder number in the input box on the home page.

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This Week

Only on Fusion

Keeping Current. So now the rumors have Microsoft buying British Telecom. Fred McClimans explains why it won't happen. **DocFinder: 5527**

Internetworking. Last week, McClimans explained his prediction that the internetworking Big Four (Cisco, Cabletron, Bay and 3Com) will shrink by one by year-end. What do you think — and how would it affect you? **DocFinder: 5526**

Site Watch. This week, we hone our virtual knives on RBOC Web sites. Which ones let you dial up useful info quickly, and which just give you an online busy signal? **DocFinder: 5525**

Fusion Face-off. Mark Gibbs and Dave Kearns don't see eye to eye when it comes to the case of United States v. Microsoft. This week, they're taking their battle online. Read their opening statements, then jump in with your own comments — and come back for their replies. **DocFinder: 5511**

Question of the week: A reader is having trouble getting a particular motherboard on a NetWare system to work with a RAID backup system — NetWare keeps crashing. Any suggestions? **DocFinder: 5527**

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News briefs, January 26, 1998

At ComNet '98 this week:

Xedia Corp., of Littleton, Mass., is expected to announce its Access Point/ATM bandwidth management device. The newest member of Xedia's Access Point product family will let network managers and Internet service providers guarantee quality-of-service levels for IP traffic over ATM WANs. Access Point/ATM uses the IETF's RFC 1577 IP over ATM specification and class-based queuing traffic management protocol. The device supports 45M bit/sec ATM links and is slated for availability next month for $19,995. An OC-3 155M bit/sec version is scheduled to ship in March.

- Cisco Systems, Inc. will announce a five-phase plan for adding voice and video capabilities to its products. The plan includes adding voice ports to the 7500 series router, a circuit emulation card to the Catalyst 5500 LAN switch and per flow queuing to the LightStream 1010 ATM switch, sources said. The strategy will culminate with policy-based, end-to-end call management in 1999 and peaceful coexistence with installed PBXes, sources said.

Cisco's 7500 *series router is getting a voice.*

- AT&T last week confirmed it will announce a significant expansion of its currently limited set of Internet customer-account management tools. The new AT&T Interactive Advantage is expected to include service-ordering, trouble-ticketing and other applications via a Web interface. Last year, AT&T began moving to Web-based management applications for users with a browser-based version of its Network Call Attempt Monitor, a call center administration tool (*NW*, April 14, 1997, page 8).
- LanOptics, Inc.'s NetGuard, Inc. subsidiary will unveil a Windows NT-based monitoring tool called Guidepost that lets network managers decide what users and applications get Internet access priority based on congestion reports.
- AbirNet, Ltd. will introduce a new version of its SessionWall-3 Internet monitoring tool. The product will let companies see which Web sites its employees are visiting not just by the URL, but by 27 different categories.

Lucent and 3Com agree to agree

Lucent Technologies, Inc. and 3Com Corp. last week said they will work together to ensure interoperability between their 56K bit/sec modems. The agreement ends a long-standing dispute that has dogged the high-speed analog technology since last year. Until now, Lucent has urged users to adopt its K56flex technology, while 3Com has been promoting x2. The problem is that those protocols do not interoperate. The companies will use an emerging industry standard referred to as V.pcm.

Local blues

A U.S. federal appeals court dealt another blow to efforts to bring competition to local telephone markets by ruling last week that federal regulators cannot require regional Bell operating companies to open their networks to would-be rivals in order to enter the long-distance arena. The 8th U.S. Circuit Court of Appeals in St. Louis ordered the Federal Communications Commission to comply with a previous ruling it issued last July. That ruling said the FCC lacks authority to set prices for competitors to buy local service for resale to customers or lease pieces of existing local phone networks. Only states have the authority to set prices, the court said. Meanwhile, MCI Communications Corp. said it would no longer resell RBOC local phone service under its own logo. MCI cited the high prices RBOCs charge resellers as the reason it would no longer pursue that strategy.

Looking inside Big Brother

The federal government has launched a Web-based gateway aimed at giving users easy access to federal resources. The so-called U.S. State and Local Gateway at www.statelocal.gov is organized by subject.

WorldCom to launch integrated local, long-haul frame service

Carriers also rolling out managed frame relay service for SNA users.

By Denise Pappalardo
Washington, D.C.

WorldCom, Inc. this week will put acquisitions and mergers on the back burner and get back to the business of rolling out telecommunications services.

The carrier will use ComNet '98 to launch two frame relay services, one that integrates local and long-distance services and another for SNA traffic.

WorldCom's new Metro Frame Relay offering will provide customers with end-to-end frame relay service consisting of local and long-distance lines. The carrier will offer the service by coupling its nationwide frame relay network with the 37 metropolitan fiber-optic networks WorldCom acquired with its purchase of MFS Communications Co. just over one year ago. And WorldCom's local presence will nearly double by week's end if the carrier's acquisition of local carrier Brooks Fiber Properties, Inc. gets shareholder approval.

In areas where WorldCom does not have its own local network, the carrier will use leased lines from incumbent local exchange carriers (ILEC) to link Metro Frame Relay customers directly to WorldCom frame relay switches, said Bob Anderson, product manager for the service at WorldCom.

Typically, long-haul carriers use Network-to-Network Interfaces (NNI) to connect to LEC frame relay networks. The drawback with NNIs is that they do not allow long-distance carriers to peer into a LEC's frame relay network to view performance and other statistics, Anderson said.

Dealing with a single provider for frame relay service appeals to customers such as Stan Miller, manager of telecommunications at Pier One Imports, Inc., a Fort Worth, Texas-based retailer that currently uses AT&T's frame relay services.

Spelling it out

Three versions of WorldCom's SNA over Frame Relay service are available. Here is a breakdown on pricing for a New York to Dallas, 512K bit/sec frame relay port with a committed information rate of 224K bit/sec.

- **Standard service: $1,285 per month**
  User responsible for CPE management and maintenance; WorldCom monitors the connection.
- **Enhanced service: $1,410 per month**
  User responsible for CPE management; WorldCom monitors the connection and performs CPE maintenance.
- **Premium service: $2,260 per month**
  Includes 24x7 network management, as well as monitoring and maintenance of the connection and CPE by Racal.

Monthly prices are based on a one-year contract.

"If we could use a single carrier for local and long-line frame relay service that was reliable and would save the company money, sure we'd be interested," said Miller, whose company supports about 50 frame relay local access ports.

While carriers such as US WEST Communications Group and Intermedia Communications, Inc. provide combined local and long-distance frame relay services, neither company can match WorldCom's geographic scope, said Tom Jenkins, broadband consultant at TeleChoice, Inc., a Verona, N.J., consulting firm. But if AT&T's acquisition of Teleport Communications Group is completed, Jenkins said real competition to WorldCom's frame relay offering will not be far behind.

Metro Frame Relay will be available beginning next week. Pricing information is not yet available.

Expanding SNA

WorldCom's other new offering, SNA over Frame Relay, is being expanded from a custom service to a generally available one.

The service targets customers looking to migrate SNA traffic from expensive and slow point-to-point lines to less expensive and higher speed frame relay lines.

The service includes provisioning of a WorldCom frame relay permanent virtual circuit (56K bit/sec to 1.544M bit/sec) and installation of a Cisco Systems, Inc. router or a Racal-Datacom, Inc. frame relay access device. Enhanced and premium versions of the service include added management capabilities.

WorldCom's SNA service is overdue, said TeleChoice's Jenkins. AT&T, MCI Communications Corp. and Sprint Corp. already offer such services.

The WorldCom service is available now (see graphic).

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For the **answer** to this week's question and more net trivia, **visit Network World Fusion** and enter **2349** in the DocFinder box.

GET THE ANSWER Now!

This week's question:

The polite term for spam is UCE. What words are behind this acronym?

CORRECTION

An article on page 35 of our Dec. 29, 1997-Jan.5 1998 issue should have said Kim Cameron is vice president and chief technology officer of Zoomit Corp., a 10-year-old company.

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Neo to bring parallelism to route processing

By Jim Duffy
Washington, D.C.

COMNET When start-up Neo Networks, Inc. demonstrates its massively parallel processing router at ComNet '98 this week, the company will unveil software that allows users to update network changes in real time.

Neo will unveil Route PathFinder, software for the company's StreamProcessor 2400 router that applies massively parallel processing to one of routing's stickier problems — route processing.

By employing StreamProcessor's custom Application Specific Integrated Circuit and 1,000 Reduced Instruction Set Computing processors, Route PathFinder provides nearly instantaneous updates of more than one million routes in addition to forwarding millions of packets per second, Neo claimed.

When pundits proclaim routers to be a network bottleneck, they usually are referring to route processing — gathering updates from other routers and performing lookups on packets. These tasks chew up a lot of processing cycles, which taxes performance and adds latency.

Neo is proposing that a series of processors, working in parallel, can take the wait out of route processing.

"It's very hot stuff," said Sam Alunni, vice president of networking for Sterling Research, in Sterling, Mass. "It addresses that other problem in routers, which is this whole route processing nonsense. You're getting this near-instantaneous network reconvergence after changes, and almost zero latency route lookups."

Neo's StreamProcessor *will be able to provide nearly instantaneous route updates.*

Route PathFinder collects and exchanges route information with common gateway and network protocols, such as Cisco Systems, Inc.'s Interior Gateway Routing Protocol.

The software also uses Remote Monitoring 2 (RMON2) agents to collect network changes in real time. RMON2 statistics help the StreamProcessor 2400 analyze downstream path information to "predict" quality-of-service requirements, and then allocate appropriate bandwidth to application flows when connections are established, Neo said.

Neo claims this capability is unique. Few competing gigabit-speed switches and routers can allocate bandwidth for application flows, the company said.

The downside to Neo's Route PathFinder is not a technical one; it is in getting users to buy something that is unproven.

"They have the same problem that any start-up has: If you're not going to be acquired how do you get into the channels?" Alunni said.

Route PathFinder will be included in the price of a StreamProcessor 2400, which costs $2,500 per port. The 16-slot router, which can hold four- and eight-port Gigabit Ethernet modules and a four-port OC-48 card, is expected to ship in the second quarter.

© Neo: (612) 979-1200

Foundry to air Gigabit Ethernet switches

3Com, FlowWise, Cabletron Systems and others also to get into the act.

By Robin Schreier Hohman
Washington, D.C.

COMNET Foundry Networks, Inc., one of the most aggressive Gigabit Ethernet start-ups, this week will introduce its first chassis-based switches at ComNet '98 here.

The company is targeting corporate backbones with its four- and eight-slot devices, which Foundry CEO and President Bobby Johnson said could replace Cisco Systems, Inc. or Bay Networks, Inc. routers.

The company's new BigIron line offers up to 64 Gigabit Ethernet ports per chassis, provides Layer 2, 3 and 4 switching, and boasts wire-speed routing capabilities. The eight-slot model tops out at 256G bit/sec of aggregate switching capacity and can handle 100 million packets/sec, said Johnson, whose company last year rolled out a series of stackable switches and routers.

"They have a plan in place to leverage the experience they've gained in the stackables and to provide their clients with a migration path," said Rob Strechay, an analyst at Strategic Networks in Boston.

Here is what other switch vendors will be up to at the show:

FlowWise

FlowWise Networks, Inc., which made its debut in September, will roll out its second product, a routing switch that can forward IP packets faster than traditional backbone routers. The TMS 1600A has 16 full- or half-duplex Fast Ethernet ports, each of which can perform wire-speed routing and switching.

Steve Painter, director of network services for the University of North Carolina (UNC), will be a beta tester. He recommends equipment for 16 UNC campuses, and said the TMS 1600A is attractive because, "We do not have to run a router network, but we get routing capabilities."

3Com

As expected, 3Com Corp. will roll out a batch of stackable switches supporting combinations of 10M bit/sec, 100M bit/sec and 1G bit/sec speeds (*NW*, Jan. 19, page 1). 3Com also is introducing a 10M/100M autosensing network interface card that sells for the same price as last year's 10M bit/sec card, and a dual-speed hub priced at $79 per port.

3Com's aim is to make migration to Fast Ethernet and Gigabit Ethernet relatively simple and affordable. The SuperStack II switches offer end-to-end application prioritization, autosensing and full Remote Monitoring support on each port. The 3300 and 1100 switches are the first from 3Com that can be stacked and managed as a single entity via one IP address. A 12-port version of the all-Gigabit Ethernet 9300 switch costs less than $1,300 per port.

Other action

Cabletron Systems, Inc. will exhibit SmartSwitch modules that support LAN and WAN interfaces, including T-1, ATM, FDDI and Fast Ethernet. FORE Systems, Inc., ODS Networks, Inc., and Xylan Corp. will be among the other companies making introductions at the show (see graphic).

© Foundry: (408) 542-0835; FlowWise: (408) 474-0385; 3Com: (800) 877-2677; Cabletron: (603) 332-9400; FORE: (412) 742-4444; ODS: (972) 234-6400; Xylan: (818) 880-3500

SWITCH SUPER BOWL

Here's a sampling of the switch products set to make their debut at ComNet '98:

Company	Product	Price	Availability
3Com	Fast EtherLink XL 3C905B network interface card	$94	Now
	12-port SuperStack II Dual Speed Hub 500	$1,275	Now
	12-port SuperStack II Switch 1100	$1,495	Now
	24-port 10M/100M bit/sec SuperStack II Switch 3300	$4,195	February
	25-port 10M/100M/1,000M bit/sec SuperStack II Switch 3900	$7,475	March
	12-port Gigabit Ethernet SuperStack II Switch 9300	$14,995	March
Cabletron	2M46-04R SmartSwitch 2000 workgroup carrier module	$4,995	Now
	9M426-02 SmartSwitch 9000 carrier module	$12,995	April
FlowWise	16-port TMS 1600A Fast Ethernet routing switch	$7,200	March
FORE	155M bit/sec single-mode fiber interface for the ForeRunner LE 155	$1,500	Now
	622M bit/sec single-mode fiber interface for the ForeRunner LE 155	$6,000	Now
Foundry	Four-slot BigIron switch/router chassis	$3,995	March
	Eight-slot BigIron chassis	$4,995	July
	Eight-port Gigabit Ethernet module	$15,995	March
	Eight-port Gigabit Ethernet management module	$16,995	March
	20-port 10M/100M bit/sec Ethernet module	$6,995	May
ODS	Seven-slot LANBlazer 7007 Gigabit Ethernet switch	$12,935	Now
	Two-port 70942SXSC 1000Base-SX module	$6,435	Now
	Two-port 70942LXSC 1000Base-LX module	$9,300	Now
Xylan	Eight-port OmniSwitch CSM-155-C-8 155M bit/sec ATM switch module	$8,375	Now
	24-port OmniSwitch CSM-A25-24 25M bit/sec ATM switch module	$6,750	Now
	LANE Software Module	$1,250	Now

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Lotus CEO: Notes, Domino going gangbusters

Jeff Papows previews Lotusphere product focus, talks of tighter relationship with Microsoft.

Notes and Domino are selling like Valentine's Day roses, no one questions Lotus Development Corp.'s marriage to IBM anymore, and even archrival Microsoft Corp. is receiving more bouquets than brickbats from the folks at Lotus. Against that upbeat backdrop and in anticipation of this week's Lotusphere '98 customer conference, CEO Jeff Papows last week sat down for a state-of-the-company chat with *Network World* Editor in Chief John Gallant, News Director Bob Brown and Senior Writer Paul McNamara.

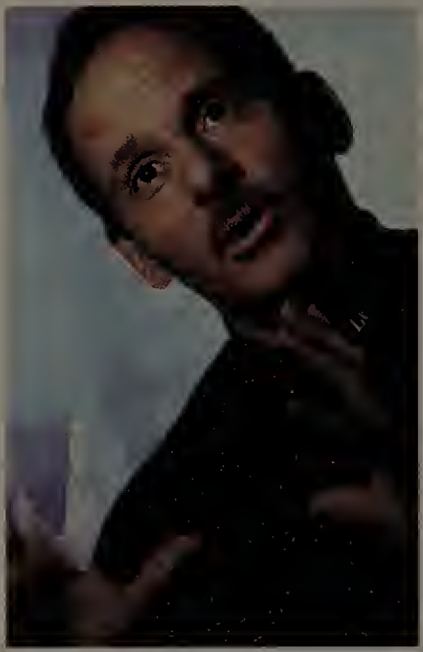
What themes will be stressed at Lotusphere?

I look forward to [spelling out] our focus from a product standpoint in 1998, which in part will be R5, the next major release of Notes [and Domino]. Remember that we just shipped 4.6, but we'll ship R5 in the second half of the year, hopefully in the early part. But the honest answer is we don't know yet.

Will there be more details about Version 5.0 at the show?

Three or four major focus items. The first is a radical focus on [user interface] simplicity, so it will be a fairly significant UI change. R5 becomes a much more integrated product, a whole Web information management environment.

We also finished the last pieces of standards value, meaning we deal with native [Multipurpose Internet Mail Extensions] and HTML consumption in a very powerful way. We complete the [Lightweight Directory Access Protocol] support for the client. At the same time, we're going to do some things with same-time/real-time asynchronous capabilities on R5. Knowledge management is going to be a major phenomenon in 1998, and the next logical step beyond it is [incorporating] messaging, groupware, accounting and scheduling, and we intend to own and dominate that market.



Another thing we'll be more clear about [at Lotusphere] is the client strategy. [In] the R5 time frame, we will congeal to two clients — a development client, Domino Designer, and a run-time client, Notes.

The other big issue there is the development model. [When R5 is released, it] will be the first time we'll have a single rapid application development and design model for these knowledge-based applications that can be fielded transparently to either a Notes client or a browser.

What's the point of the Notes client then?

It's about integration. It's about providing a place where you live, where all of the information from the Web — from your messaging, groupware and knowledge management applications — comes together.

Other Lotusphere goals?

Part of the message will be one of momentum. [1997] was a banner year by anybody's expectations. The public expectation that was set at Lotusphere a year ago was to ship 8.5 million seats. In fact, we shipped 10.5 million.

My guess is that we [ended] 1997 with something close to 25% or 26% of the paid Web server market, which was again materially ahead of our expectations. Domino server growth in 1997 was up 260%, which was tremendous.

Where does that '97 performance leave the Notes installed base?

That will put us over 20 million units, which is a big deal for us. We don't break out revenue [and] haven't since the merger [with IBM], but I will tell you that 1997 was the greatest year of revenue growth in [Lotus'] history post-1990.

You've said that you don't see Lotus' eSuite Java-based productivity applications as Microsoft Office killers. But as your software becomes more stable, do you see hardware manufacturers that have a fair level of animosity toward Microsoft using eSuite as their offering?

It's an alternative. [But] we have to be very careful not to get into another industry food fight here. When I say "we" I mean Lotus, because eSuite will fail if we don't deal with the realities of interoperability in the same way that we do with Notes and other Microsoft products, like NT and Windows. [This means] if you've got an eSuite spreadsheet you've got to be able to ingest an Excel spreadsheet. I don't want the historic notion of this industry tension to screw up the customer value.

Do you have an ongoing dialogue with Bill Gates then?

Yeah, [we have] regular e-mail exchanges every month. I talk to him every six or seven weeks by telephone. I was out [in Redmond] last year for two meetings where I took people out to the corporate campus and brought development executives. [We] sat down with the Windows guys, NT guys and [Internet Explorer] team. I would describe our relationship as practical. And, I think customers have really appreciated us putting down the rotten tomatoes. . . . We simply cannot continue to act like kids in a schoolyard when the customers' interests are affected. . . . It doesn't mean we can't compete aggressively or that we won't.

Bill has got his quirks [and] I've got my own, but when you get down to face-to-face kinds of conversations and you're trying to be generally evenhanded, more often than not people react in kind, and Bill's no different.

Get more online:

An expanded version of our interview with Jeff Papows

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www.nwfusion.com

Can that relationship be so friendly when the issue is Java?

No. We disagree on it and some of the most heated conversations Bill and I have had are around Java, although it's not as one-sided as you might think. He supports [Java] as a language. There's absolutely no issue [about that]. He doesn't support [Java] as a platform for reasons that it doesn't take a rocket scientist to understand; because it lessens his control. I support [Java] for exactly those same reasons. So we agree to disagree.

This is probably a good time to segue into another matter: Given the current situation between Microsoft and the Department of Justice, what is Lotus' position?

We're agnostic about the browser argument. We support both IE and Navigator, always have . . . and we'll do an equivalent job of integrating them both [with our software] and letting the users choose.

You've had a number of high-level executive defections recently, including Deb Besemer, your executive vice president of worldwide field operations. Are you concerned?

Well, it gets overblown. Let me put it in perspective: Lotus had about 5,200 employees when the IBM acquisition took place. Today we're very close to 10,000. So half a dozen executives leave and get pretty prominent attention, with Deb's being the [most talked about departure]. OK, a half dozen people left, but put in perspective, we've also employed an incremental 5,000. ■

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Alteon goes beyond LAN switching

New device takes on load balancing and Web cache management.

By Bob Brown
San Jose, Calif.

Alteon Networks, Inc. this week will introduce a 10M/100M bit/sec Ethernet switch that acts like a front-end processor for Web server farms and Web cache servers.

Alteon, a pioneer in the Gigabit Ethernet switch market, hopes its ACEdirector 1 switch will replace stand-alone load-balancing and Web cache redirector products, which usually consist of software running on standard PCs or servers. The company claims its $7,995 switch can cost about two-thirds less than buying a separate LAN switch, load balancer and cache redirector.

The eight-port ACEdirector 1 enables customers to direct HTTP, File Transfer Protocol and other application sessions to specific servers based on availability of the machines and the traffic's priority level. Load balancing can help ensure that companies get the most bang for their server processor buck by not overloading some servers while others stand idle.

The switch knows to direct traffic to certain servers based on virtual IP address information assigned to servers and loaded into a Domain Name System (DNS) server by a network administrator. The switch watches for downed or overloaded servers by checking the status of connections at regular intervals defined by the administrator.

Cache the Web

The switch also is able to serve as a Web cache redirector, intercepting requests for data targeted at remote Web sites and funneling the requests to the most appropriate cache server. This feature can deliver better response times and reduces WAN bandwidth requirements.

Each switch port features an Application Specific Integrated Circuit that contains two Reduced Instruction Set Computing processors designed by Alteon. The processor combination enables each switch port to handle more than 25,000 TCP/IP sessions per second.

Alteon's ACEdirector 1 *distributes application sessions to the best available server.*

Customers said the product also should simplify management by eliminating one or two network devices.

"I'd also rather have load balancing on a switch than on a PC platform because the switch can make wire-speed connections. You won't get that kind of performance on a PC unless it is the very top-of-the line model with massive memory," said Lee Damon, senior systems administrator for Qualcomm, Inc., a wireless digital communications company in San Diego.

Damon has yet to get his hands on the new Alteon gear, which currently is in beta testing at various customer sites. But he said the ACEdirector 1 could be useful to Qualcomm, which currently uses a DNS-based system that simply directs requests to the company's Web servers on a round robin basis, but does not take into account how busy each server is at the time.

ACEdirector 1 will be available next month. Gigabit Ethernet and ATM uplinks will be introduced this summer, the company said.

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Domain name plan shot down

By Sandra Gittlen
Washington, D.C.

Companies that thought they were ahead of the game by preregistering for new domain names are likely to find themselves warming the bench instead.

The U.S. government appears poised to reject the Internet Society's Council of Registrars (CORE) plan that would introduce seven new generic top-level domains (gTLD) and create a shared database from which CORE members could register names in those domains. Internet Society President Don Heath admitted as much at a press conference here last week.

Ira Magaziner, President Clinton's top Internet adviser, instead is proposing the addition of a single gTLD to the existing five: .com, .org, .edu, .mil and .net. According to participants in the planning process, CORE might be allowed to act as a registry for the new domain, but would have to allow other registrars to join its 88 preselected members.

Current members have already each paid $10,000 to create the shared database and to qualify to register domains.

Under the new plan, the registrars would be qualified by a nonprofit corporation established by the government, said Anthony Rutkowski, former Internet Society president, who has met with Magaziner.

"The whole process will be separated into a back-end operation with the database and the front-end operation with the customer service," Rutkowski said.

Currently, Network Solutions, Inc. (NSI) registers domain names in .org, .net and .com, managing the database and the sales.

Under the new plan, NSI would have to split into two entities: its InterNIC domain name database service and its World-NIC registration service. This would ward off further charges of NSI holding a monopoly on Internet names.

No guarantee

For companies that already have signed up for CORE's domains, it is back to the drawing board. Their preregistrations will not be valid under the government's system, one source said.

While registrars were urged not to take preregistrations, most did, and some even accepted prepayment. It is unclear whether customers will get that money back.

"Some companies are charging nonrefundable fees," said Tom Ho, manager of registry functions at NetNames USA in New York. Although his company is accepting credit cards, customers will not be charged unless the new domains are approved. However, other companies are charging users to secure a place in a queue if the domains are opened up, Ho claimed. ■

Get more online:
- Details of the CORE proposal
- A Q&A with Magaziner

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Software firm tackles Y2K at the desktop

PinPoint to unveil Web browser-based product next week.

By Jim Duffy
San Jose, Calif.

When people consider the Year 2000 problem, most probably think of the giant mainframes holding decades-old records that could disappear when the clock strikes 00.

But the people at PinPoint Software Corp., a 50-employee operation based here and in the U.K., are more concerned about the desktop systems that vastly outnumber the big number crunchers. The company next week will unveil software that allows users to test PC hardware, software and applications for Year 2000 compliance.

The new product, called ClickNet Y2k, requires use of PinPoint's existing ClickNet Professional inventory management software to determine Year 2000 compliance and access information on vendor compliance plans and suggested remedies. ClickNet Professional, which runs on network managers' PCs and servers running Windows 95 or NT, boasts an installed base of 800,000 nodes, said Vince Rossi, PinPoint's senior director of business development.

ClickNet Y2k runs on network managers' Windows 95 or NT workstations as well, and requires Netscape Communications Corp.'s Navigator 3.0 or greater, or Microsoft Corp.'s Internet Explorer 3.0 or greater. PinPoint developed a proprietary plug-in for these browsers that managers can download from the company's Web site (www.clicknet.com).

The Y2k plug-in allows managers to download a compressed knowledge base of the Y2k compliance status of 1,500 products from the ClickNet Web site. The plug-in then compares a user's PC inventory data, stored in a ClickNet Professional database, against that knowledge base.

ClickNet Y2k then generates more than 20 summary reports that reveal compliant and noncompliant hardware and software. The reports also show:

- Vendors' first available compliant product versions
- Severity
- Workarounds
- Patches
- Vendor contact information

ClickNet Y2k also validates that the corrective actions implemented by users are complete, and provides a documented audit trail for future reference. The product also performs a more stringent test for Year 2000 rollover and leap year rollover compliance.

PinPoint also has published a Year 2000 survival guide online at http://y2k.clicknet.com.

"I found the data pretty helpful," said John Ewing, LAN project manager at Bank of America in Las Vegas. "There are so many unknowns about this Year 2K and how it's going to affect us. So we're going out there trying to gather as much information as we can and then trying to sift through what really means something, and what we really need to be careful of and react to."

If there is a downside to ClickNet Y2k, it is that PinPoint will not proclaim a PC as absolutely Y2K proof, Ewing said.

ClickNet Y2k will ship in February and cost $30 per node.

©PinPoint: (408) 997-6900

PROFILE: PINPOINT SOFTWARE CORP.

Founded: 1992
Headquarters: San Jose, Calif.; Borehamwood, England
Management: Norman D. Klapper, chairman and CTO; Lou Ryan, president and CEO
Product: ClickNet Professional, a network diagramming, documenting, reporting and management tool
Employees: 50

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THE WAY IN™

Circle Reader Service #26

Heavyweight backing doesn't ensure DSL delivery

By Tim Greene

Microsoft Corp., Intel Corp. and Compaq Computer Corp., backed by the biggest local phone companies, want to put broadband Internet access under your Christmas tree this year.

But for all their good intent, they might as well have sugarplums dancing in their heads.

The companies this week will announce that they have formed the DSL Consortium, dedicated to promoting an International Telecommunication Union (ITU) standard for a flavor of digital subscriber line (DSL) technology that is easy and inexpensive to deploy.

Microsoft would support this so-called splitterless DSL with its operating systems, and Compaq would install customer DSL modems in its Presario PCs, powered by Intel processors.

Vendors have their own names for the technology, including DSL Lite, EZ-DSL and Megabit Modem.

It would then be up to the phone companies to offer splitterless DSL, which adds a high-speed data channel to a regular voice phone line. Splitterless DSL supports speeds of 1.5M bit/sec toward the customer and 384K bit/sec in the other direction.

All well and good, but even if the ITU works at top speed, it could only come up with a preliminary standard by October because of its rigid schedule.

That would not leave much time to develop and manufacture hardware and software, advertise products and then ship them to stores for the holidays.

“By Christmas is more enthusiasm than reality,” said Ken Krechmer, a member of the ITU committee that will handle a splitterless DSL standard.

Even so, the DSL Consortium has at least drawn wide public awareness of the technology through a front-page story in *The New York Times.*

Consumer demand might prod regional Bell operating companies to offer DSL services sooner than if they were left alone.

“Everybody is most concerned about the RBOCs. The RBOCs screwed up real bad with respect to ISDN. The consortium is saying, ‘Can we show the RBOCs a strong enough unified front so they don't screw it up again this time?” Krechmer said.

He noted that as with DSL, RBOCs strongly supported standards for ISDN, but then dragged their feet when it came to deploying ISDN services.

At least one RBOC said its philosophy for DSL will be the same as with ISDN. “We'll let market demand drive the deployment of broadband services in general. That was behind our approach to ISDN,” said a spokesman for SBC Communications, Inc.

The idea of splitterless technology is not new. Rockwell Semiconductor and Northern Telecom, Inc., have promised that they will produce such technology next year, and Netspeed, Inc., promises it this year.

Beyond the technical problem of delivering DSL without a splitter, mass marketers have to worry about whether modems from different vendors will interoperate.

Compaq would not want to install DSL modems in its PCs if the modems could not talk to modems in all carrier networks. That drives the interest in a standard.

Telephones pose another obstacle to splitterless DSL. They are not standardized, so some are noisier than others and could generate voice signals that disrupt DSL in the same line. However, Globespan Technologies, Inc. has an inexpensive filtering device that can be put in line with the phone to clean up the voice signal. ■

A BETTER DSL?

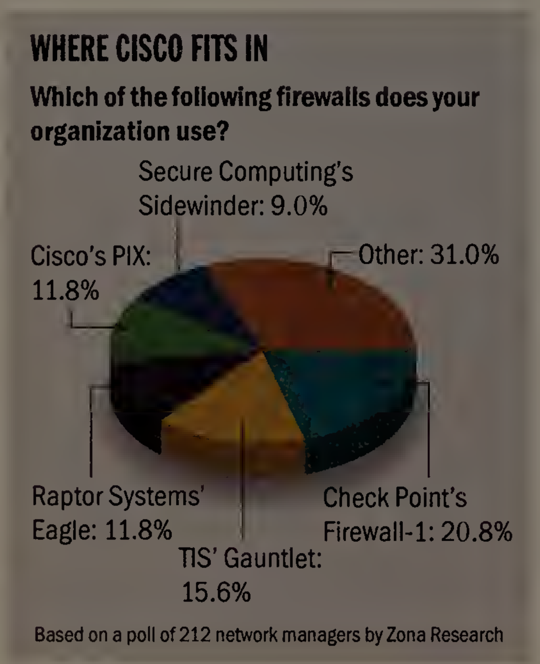
Splitterless DSL can deliver a voice channel and a data channel over a copper phone line without the use of a box called a splitter at the customer site. Splitters filter the voice from the data. The technology eliminates expensive splitter installation.

Cisco, Microsoft reveal plan to merge protocols

By Ellen Messmer

Cisco Systems, Inc. has a master plan: to turn its routers into remote access servers capable of authenticating users with strong encryption before granting them access to corporate LANs.

But the company needs help from Microsoft Corp. to ensure that users have the right client software to use these next-generation, encryption-capable tunneling super-routers.


WHERE CISCO FITS IN

Which of the following firewalls does your organization use?

Based on a poll of 212 network managers by Zona Research

The router kingpin told Microsoft it will not compete in the desktop arena if Microsoft delivers the goods in the next generation of NT. However, while Cisco might think this kingly alliance is signed and sealed, Microsoft's lack of commitment may lead to some Shakespearean twists before it is all settled.

Cisco's plan is to combine two emerging standards: the Layer 2 Transport Protocol (L2TP) and the IP Security (IPSec) protocol.

L2TP is the protocol that Cisco and Microsoft have agreed to use in place of the proprietary point-to-point tunneling technologies in their products today.

Point-to-point tunneling enables remote PC users to open a connection to a host, which then assigns an IP address to the remote node. Once assigned, the address makes the PC look as if it is sitting on the corporate network.

By combining L2TP with IPSec, the tunnel will only be established after the user's identity is checked by swapping X.509 public-key certificates, as called for by IPSec.

L2TP is expected to be finalized by the Internet Engineering Task Force (IETF) in the next few months. IPSec already is a completed IETF standard, with many firewall and virtual private network vendors pledging to support it.

Now the company plans to push the L2TP/IPSec pairing as an IETF standard.

However, for a Cisco router to act as the L2TP/IPSec remote-access server, the desktop user must have client software based on the combined protocols to set up the point-to-point tunnel, present the public-key certificate and encrypt the data.

For desktop software, what better ally to have than Microsoft? “We're helping Microsoft implement IPSec with ISAKMP/Oakley key-exchange in NT 5.0,” said Terry Bernstein, product manager for IOS security at Cisco. “They're using our implementation and our code. We're working with Microsoft to make sure this gets into NT 5.0.”

Without desktop support, two L2TP/IPSec routers would still be able to set up an authenticated, encrypted point-to-point session in what Cisco calls a “mandatory” way. But the user would not be authenticated nor the data encrypted until it reached the L2TP/IPSec router.

Microsoft's commitment to support Cisco in this plan — a company against which it wants to compete in the router market but is collaborating with on directory products — last week came into question.

Microsoft's group product manager for Windows NT and networking, Enzo Schiano, said Microsoft has licensed Cisco ISAKMP code but said, “It's just a technology we're working on right now. It's not a given it will be in NT 5.0. We're working hard at that, but we don't want to commit.”

Schiano said that a rudimentary, “not well documented” version of IPSec already is in the Beta 1 of NT 5.0, but there are no specific plans to have IPSec or the combined L2TP/IPSec in later betas. ■

Gigabit Ethernet standard delay looks inevitable

By Robin Schreier Hohman
Fort Lauderdale, Fla.

While vendors this week will flood ComNet '98 with Gigabit Ethernet gear, they may have to wait until midyear to call their products standards-compliant.

That is because acceptance of the key Gigabit Ethernet standard proposal — the IEEE's 802.3z specification — looks as if it will be delayed for at least three months.

The proposal has been in the works for two years and was expected by most industry observers to be ratified in March. But problems related to running Gigabit Ethernet traffic over certain lengths of fiber could push approval of the standard to June or even later this year.

Members of the Gigabit Ethernet Alliance (GEA), a consortium of 120-plus industry members that has been pushing for a Gigabit Ethernet standard for about two years, said that they could not come up with a conformance test for the problem following an IEEE subcommittee meeting here last week.

It is unclear how a delay would affect customers, though observers said early Gigabit Ethernet adopters should press vendors to put any standards upgrade promises in writing.

The GEA attributed the standard holdup to a signal distortion problem that can occur when running Gigabit Ethernet traffic over certain samples of multimode fiber (*NW*, Nov. 10, 1997, page 1). “It's a fiber-optic problem, it's not a Gigabit Ethernet problem . . . it has nothing to do with protocols,” said Bob Grow, vice chairman and technical liaison for the GEA.

But the bottom line is that Gigabit Ethernet over multimode fiber sometimes works from 260 meters to 550 meters, as proposed, and sometimes it does not.

While there has been speculation in the industry that the GEA will scale back the distance for Gigabit Ethernet, the group vehemently denied that. ■

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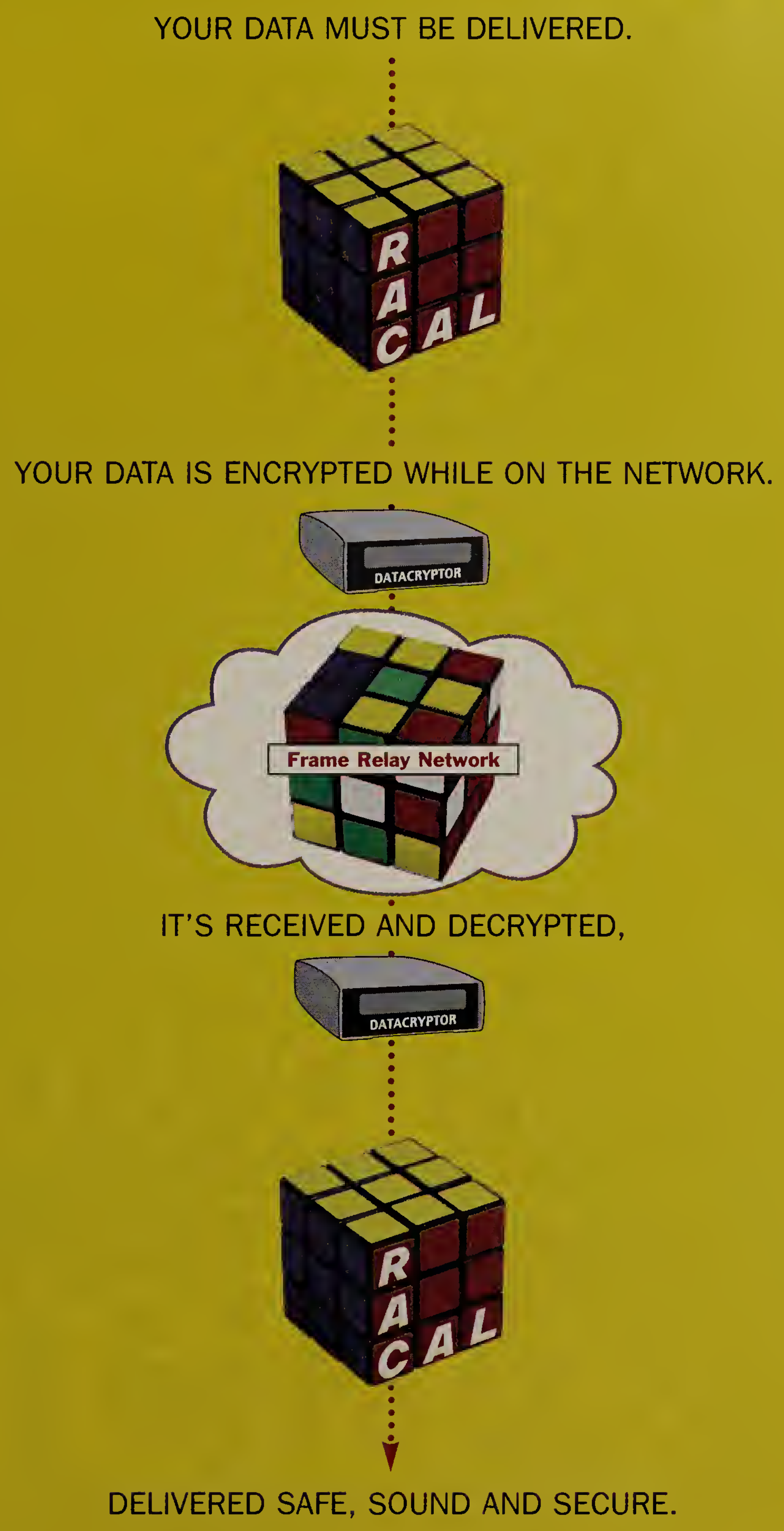
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MAE

Continued from page 1

COMNET

offering adequate access by most ISP standards.

In fact, WorldCom spent $5 million last year to upgrade its MAEs with additional switches, and intends to spend $5 million more this year (*NW,* Nov. 10, 1997, page 12).

The millions needed to upgrade equipment demonstrated to the carrier that FDDI was reaching the end of its usefulness and that another solution had to be examined. MAE-East currently is being pummeled, leading to high packet loss, one source said. MAE-East and MAE-West also will be upgraded to ATM this year, a WorldCom spokeswoman said.

"The other alternatives, such as FDDI or Gigabit Ethernet, don't give you the fine-grain traffic allocation of ATM, which ISPs really need," said Tim Weingarten, research associate at BancAmerica Robertson Stephens, a San Francisco-based consulting firm.

While ATM is expected to be at the core of MAE-Central, Gigabit Ethernet switches from Digital Equipment Corp. also will be installed, according to one source close to the project.

Construction at MAE-Central already is under way, with at least one BPX switch deployed. But the project will not be completed until the middle of this year. WorldCom is building this MAE in Dallas' InfoMart, considered to be "the" high-technology facility in that area, according to a company spokeswoman.

WorldCom is hoping to slow the rush by ISPs to private peering, a charge being led by GTE Internetworking, MCI Communications Corp., UUNET Technologies, Inc., Sprint Corp. and other large ISPs. Private peering lets ISPs sidestep the MAEs and network access points to exchange traffic, and instead establishes dedicated, high bandwidth connections between two ISPs.

In fact, one ISP questioned the need for another Tier 1 MAE, citing private peering as a better way of exchanging traffic among ISPs. "Right now, we are looking at OC-3 or better interconnects between GTE and the major [Internet service] providers," said John Curran, chief technical officer at GTE Internetworking. ■

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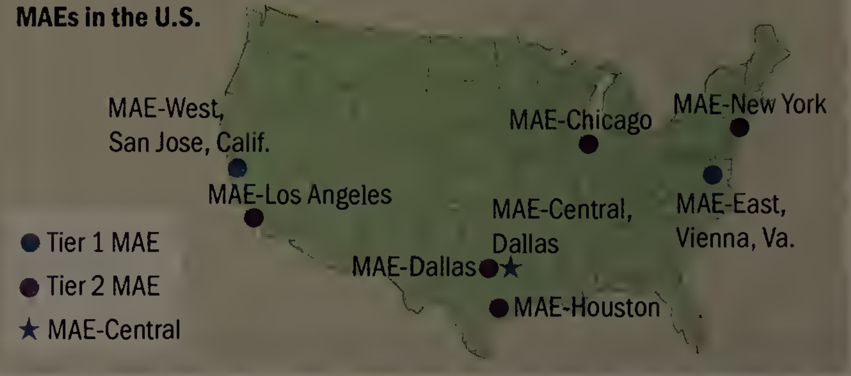
WORLDCOM'S LAY OF THE LAND

WorldCom's MAE Central, the first MAE to be based solely on ATM, is slated to be built in Dallas. It will join WorldCom's two other Tier 1 MAEs in the U.S.



Level 3

Continued from page 1

guarantees, will come in about two years, according to the company's CEO, James Crowe.

Level 3 boasts plans for a 20,000-mile fiber-optic network in the U.S., transoceanic cables and foreign networks, and is blessed with very deep pockets. So the company will be a force to be reckoned with whether its vision is right or wrong.

There is another reason to listen to Level 3. Crowe and Kiewit Diversified Group, with roots in mining and construction, have done it before. They combined to build MFS Communications Co. from the ground up as the first major competitive local carrier. Started with $500 million in Kiewitt funding, MFS sold for $14 billion in 1996.

Part of the Level 3 promise: network infrastructure costs so low that it can ignite a price war with the established phone companies, analysts said.

"It's going to be a wonderful free-for-all," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy.

It is uncertain what Level 3 will charge customers, but "the pricing differential will be so astronomic that the established carriers will have to react," Dzubeck said. "These guys are really going to have an impact."

Dzubeck said it costs an IP service provider a mil — one one-thousandth of a cent — to offer a minute of long-distance voice service. The cost for a traditional phone company is more like two cents.

MFS II?

Under the Level 3 model, customers will buy not dial tone but Web-tone access to an IP network. The backbone of that network will be all fiber, guaranteeing ample bandwidth to bear scores of gigabits per second of user traffic.

Traffic among destinations on the Level 3 network could be assured qualities of service because Level 3 would have control of the entire network being used. Traffic traveling to other carriers' networks for destinations off the Level 3 network might or might not support those qualities of service, Dzubeck said. For some destinations, traffic might use the public Internet, where today no service quality can be guaranteed.

Business-quality voice will probably not be ready until 1999, Dzubeck added. A service based on the most inexpensive backbone can still be costly, said Bill Homa, communications director for Hannaford Bros. and Co., a supermarket chain based in Scarborough, Maine, which is looking at ATM to anchor its network.

"The key is who controls the local loop. If you have multiple locations, it's going to be expensive if you have to use the local loop for access," Homa said.

Level 3 will pay those access fees except where Level 3 can run fiber directly to the customer, Crowe said. But he would not say what impact access fees would have on pricing, which is still being worked out.

Level 3 is the most well-funded domestic player among new IP carriers, but the boldest is CTR Group, Ltd. CTR has started up Project Oxygen, a plan to circle the globe with nearly 200,000 miles of fiber-optic cable to support a Super Internet that will support all services (*NW,* Jan. 19, page 12). ■

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PROFILE: LEVEL 3 COMMUNICATIONS, INC.

Founded:	January 1998 (name change from established Kiewit Diversified Group)
Headquarters:	Omaha, Neb.
Funding:	$2 billion cash, $1 billion in other assets, all from Kiewit Diversified Group
Products:	Voice, data and video over local and long-distance IP fiber-optic network. Rollout scheduled in six cities by year-end
Competitors:	All major carriers, local and long distance, U.S. and international
Network plan:	About 20,000 miles of fiber-optic cable in the U.S. and underseas

JNDI

Continued from page 1

Development Kit (JDK), prompting an angry response from at least one partner in Sun's Java alliance.

"I am not pleased at the amount of time it is taking for JavaSoft to utilize a perfectly acceptable naming and directory interface, supported by the major partners, in the core JDK," said Christopher Stone, senior vice president of strategy and corporate partnerships for Novell, Inc.

The JDK is the set of tools and development environment used to build, execute and test Java applets and applications.

Stone and others said leaving JNDI out of JDK 1.2 — due to ship in June — may slow efforts to build server-side Java programs because developers would not automatically have all the tools to access legacy directories. "We're frustrated beyond belief at this," Stone said.

How does it work?

JNDI is one of Java's platform APIs. It provides Java applications with a single interface to multiple naming and directory services in the enterprise, including Novell Directory Services (NDS), Lightweight Directory Access Protocol (LDAP) and Sun's own Network Information Service (NIS).

Using a Java application built with JNDI, a company can access information about a customer — such as an e-mail address, a phone number and an order history — that resides in multiple databases.

"This is a piece of Java development that needs to be there for anybody creating server-based Java applications," said Ron Rappaport, an analyst at Zona Research, Inc. in Redwood City, Calif. "Any type of Java application is going to need access to all of these different types of naming and directory services."

The JNDI "reference implementation" — a working version of the code — is set to be posted at java.sun.com on Friday. It was originally scheduled to be released in the third quarter of 1997. The final specification, or blueprint, of JNDI — first due in the second quarter of 1997 — was unveiled last month.

Despite the delays, some third-party vendors began integrating JNDI into their products using early draft specifications made available last year by JavaSoft. WebLogic, Inc., a San Francisco-based start-up that makes server-side Java application tools, included JNDI in its Tengah server, released in November.

Still, Dietzen joined Stone in expressing concern about JNDI being released as an extension, or separate add-on, to JDK 1.2. Since JavaSoft licensees aren't required to ship extensions, enterprise developers lacking JNDI would not be able to use Enterprise JavaBeans to build server-side applications, he said.

But another third-party developer said the absence of JNDI from the JDK represents only a minor inconvenience for enterprises.

"Whether it's part of the core has much less impact on the server side," said Nathan Abramson, director of system architecture for Art Technology Group of Boston. "If someone's paying a lot of money to buy your server-side product in the first place, they're probably willing to go the extra step to download JNDI." ■

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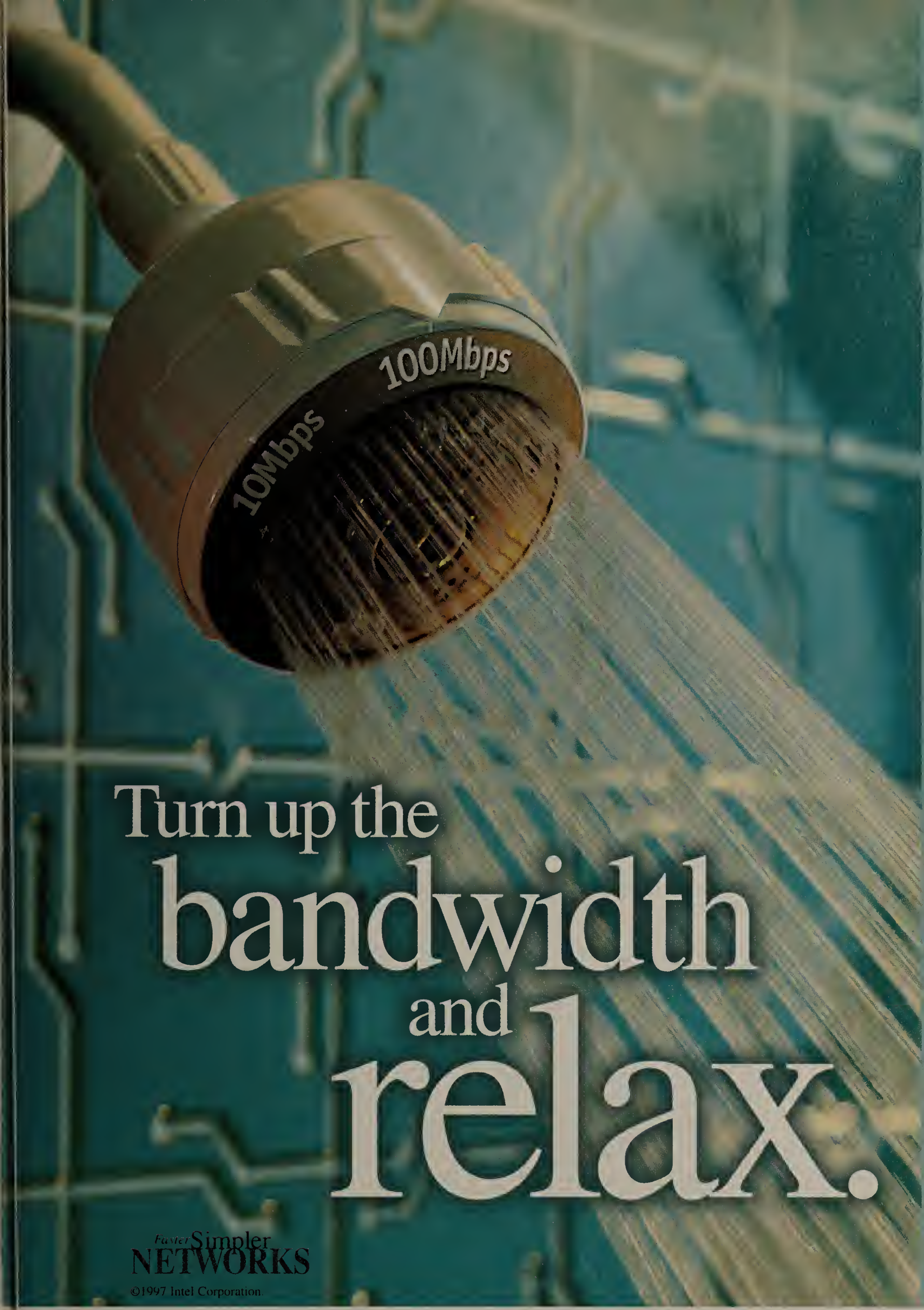

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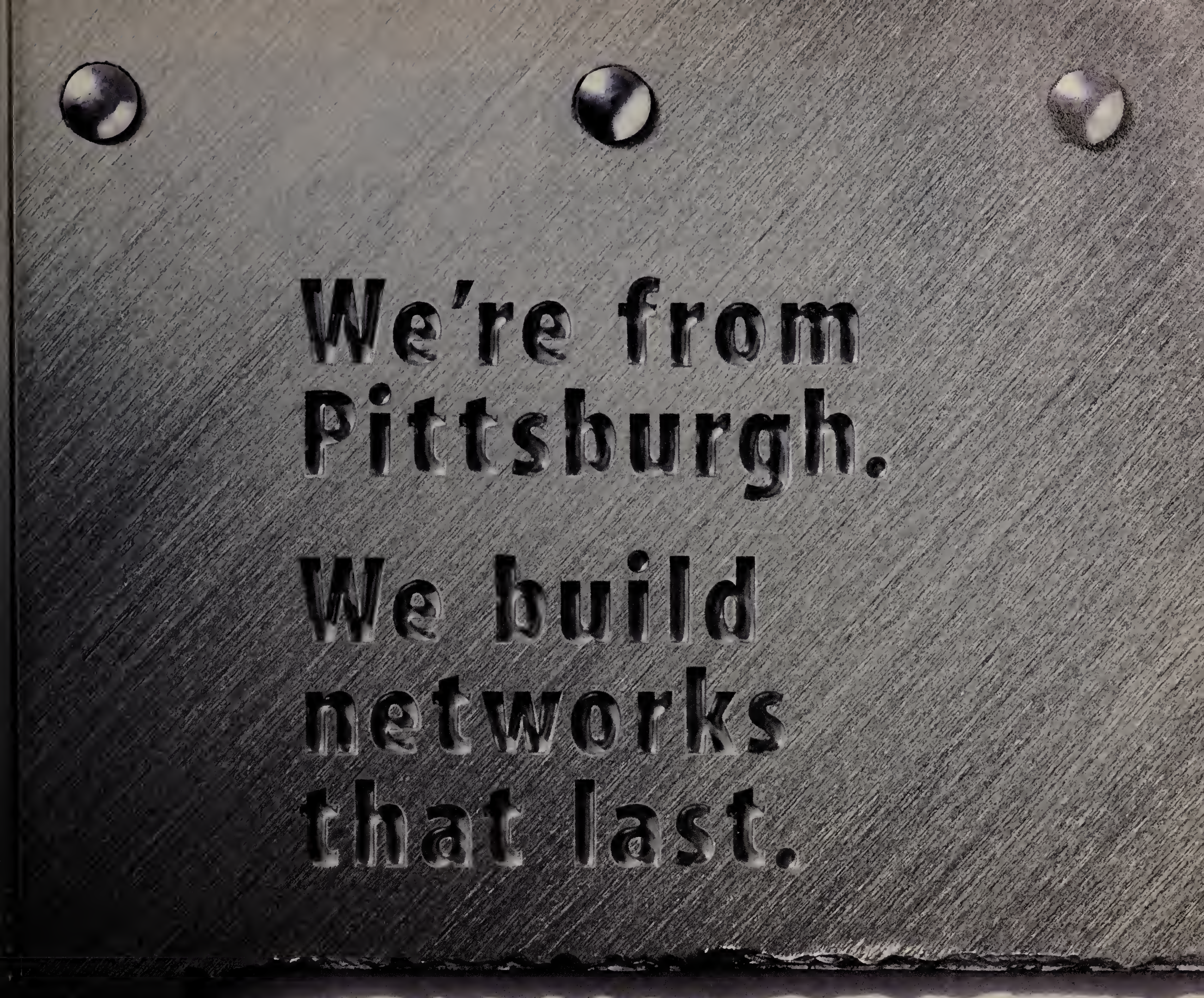

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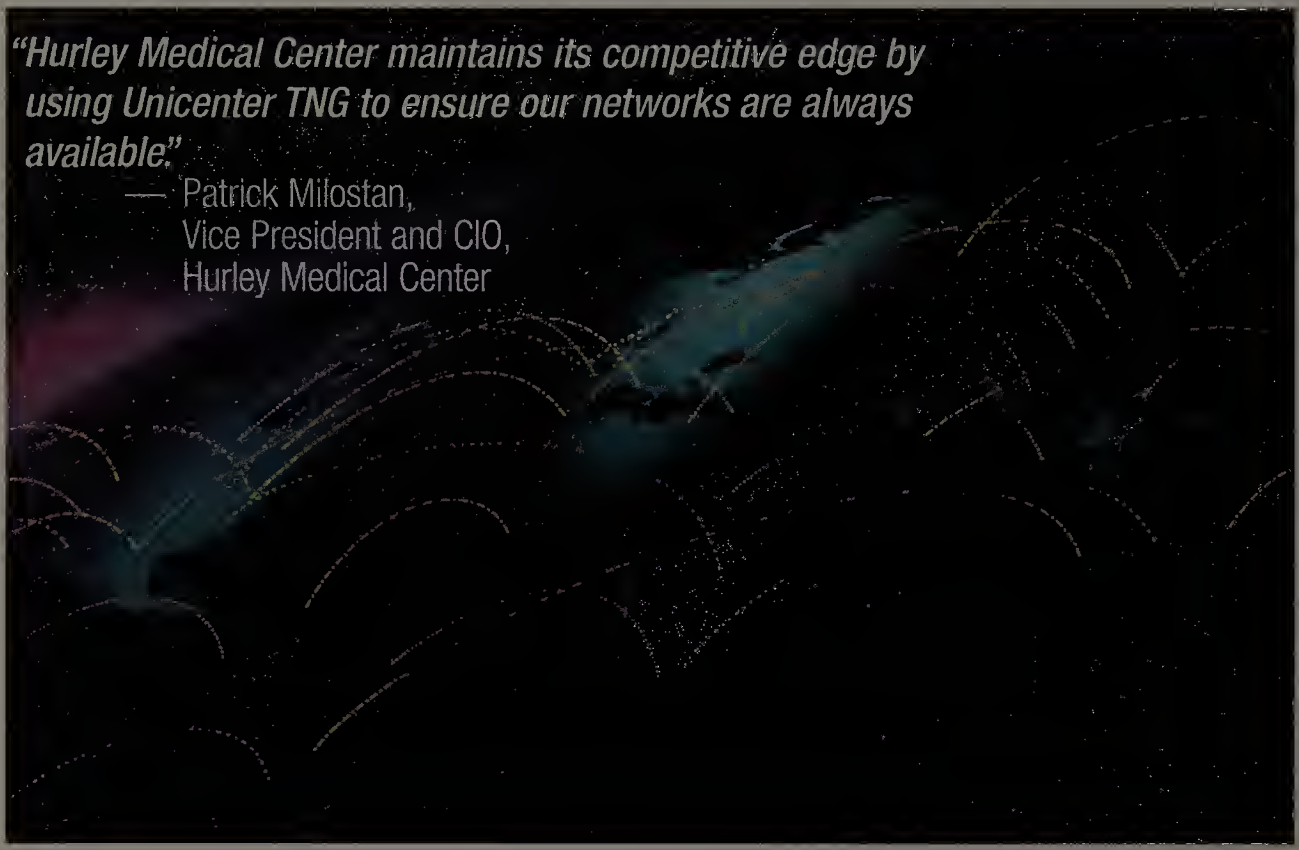

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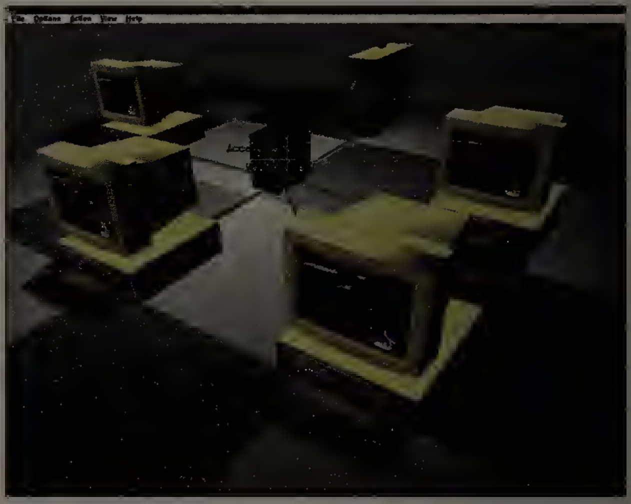

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Briefs

■ *Tucson, Ariz.-based* **Artisoft Corp.** *is introducing a version of its peer-to-peer network software that lets companies integrate Windows NT machines into LANtastic 7.0 nets.* **LANtastic for Windows NT** *lets an NT 4.0 Workstation machine serve up files and applications and administer security policies to any number of NT 4.0, Windows 95 and 3.X, DOS and IBM OS/2 desktops. Available now, it costs from $99 for a single-user license to $399 for a 10-user pack.*

LANtastic *offers low-cost NT workstation nets.*

© Artisoft: (800) 233-5564

■ **Novell, Inc.** *next month will begin selling* **Vinca Corp.'s StandbyServer for NetWare** *as part of Novell's high-availability system software line. StandbyServer provides fault tolerance by mirroring data between NetWare 3.X and 4.X servers running on standard Intel-based hardware. At $3,999, StandbyServer will be positioned as the low-end partner to Novell's SFT III software, which requires more costly certified hardware configurations and NetWare Loadable Modules to guarantee 24-hour uptime.*

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■ **Intel Corp.** *last week announced nine network products for businesses or sites with fewer than 50 employees.*

The **InBusiness line** *includes three Ethernet hubs, three Fast Ethernet hubs, two Ethernet switches and Internet Station, software designed to allow users to access the Internet using one Internet service provider account. The products, which started shipping this month, sprang in part from Intel's acquisition of Dayna Communications, Inc.*

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Microsoft cuts off NDS for NT customers

By Christine Burns

Redmond, Wash.

If you're running Novell, Inc.'s NDS for NT directory services software and your server crashes, don't come crying to Microsoft Corp.

In documentation posted on its Web site (www.microsoft.com/ntserver/comparisons/ndsfornt2.asp), Microsoft said it will not support users who have authentication problems on NT machines running Novell Directory Service (NDS) for NT.

Novell first shipped NDS for NT in December, providing customers with a single point of administration for NT and NetWare accounts. The directory services software sits on NT domain controllers and redirects security information from the NT Security Account Manager to the NDS database.

Microsoft's gripe is NDS for NT alters the base operating system, making NT less secure and interfering with Microsoft's planned upgrade path from NT 4.0 to 5.0, said Tanya Van Dam, product manager for NT Server. "[Novell alters] the code so we have no more control over it, and that is why we can't support [NDS for NT]," she said.

However, Microsoft's decision to deny service on all authentication issues is too broad, said Randall Kennedy, an analyst with Giga Information Group, in Santa Clara, Calif.

Some authentication issues, such as a user's inability to log in to local NT machine accounts, are not related to NDS on NT. "The loser in this political battle is the customer," Kennedy said.

One user took Microsoft's refusal to support the software as an endorsement of the product, which he sees as a threat to the upcoming NT 5.0 Active Directory. "Microsoft wouldn't use a power play like this one if they weren't threatened by what NDS for NT can do," said Josh Turiel, director of information services at Adlife Company, Inc., an advertising firm in Norwood, Mass.

But Novell will support NDS for NT users. Should an NDS for NT server crash, Novell can ascertain whether it is a Novell or NT problem. If it is the latter, a user can run the NDS for NT uninstall option and then call Microsoft to fix the bug on the standalone server. ■

Fast Ethernet LANs put to the test

By Scott Lajoie

Everett, Wash.

Fluke Corp. this week will upgrade its line of portable LANMeter test tools to monitor Fast Ethernet networks and to allow administrators to access test results via the World Wide Web.

Since the line's inception five years ago, these simple handheld devices have allowed administrators to test network devices and cable connections using basic electronic signaling and to make crucial adjustments from the field.

One twist with the 683/686 Enterprise LANMeters is that they each feature an embedded Web server that lets remote network administrators access readings via a Web browser.

Beta tester Tom Linz, the enterprise network manager for Centura Health, in Colorado Springs, Colo., compared his use of the Fluke device to fixing a leaky roof. He said he visits a site and leaves a LANMeter on the segment. When an end user calls to report a recurring problem, Linz can dial into the LANMeter via the Web to get a reading on the network's health.

The improved test tools also feature an option called WideArea Wizard, which accesses information from WAN gear.

The LANMeter weighs less than five pounds and is about the size of a shoe box. The devices cost from $9,995 to $13,295, with the WideArea Wizard option an additional $995 per piece.

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- A guide to diagnosing problems on a LAN

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NT 5.0 scalability to come at a cost

High-end features won't ship with base operating system.

By Christine Burns

Redmond, Wash.

Users looking for more scalability with Windows NT 5.0 had better be prepared to pay.

Microsoft Corp. is prepping an enterprise edition of NT 5.0 that will cost more than the basic version, said Jim Allchin, senior vice president of the business and systems group. He claimed that for the extra money, NT 5.0 Enterprise Edition customers will gain performance and availability features that match up well vs. those in Unix.

And even the basic version of NT 5.0 will be better tuned for performance, Allchin said.

"But we will not push clustering or the ability to run NT on huge, monster SMP [symmetric multiprocessing] machines down to the base product," he said. "Those [features] will be reserved for the enterprise-based product."

NT 5.0 Enterprise Edition will support clustering across up to four nodes and enable users to run the operating system on 16- and 32-way SMP machines.

The software also will support 64-bit applications as well as applications that need as much as 64G bytes of memory to run.

Windows NT 5.0 Enterprise Edition likely will be the version of NT that will run on servers powered by Intel Corp.'s planned 64-bit Merced chip, Allchin said.

While Allchin declined to say how much NT 5.0 Enterprise Edition will cost, analysts said the NT 4.0 Enterprise Edition is priced four times greater than the $995 edition of NT Server.

NT 4.0 Enterprise Edition shipped last fall, a year after NT 4.0 was first available. The premium edition includes two-node failover clustering and a license to run the operating system on an 8-way SMP box. This version of NT also supports applications that need access to as much as 4G bytes of memory to run.

Microsoft would not say when it expects NT 5.0 Enterprise Edition to ship.

Analysts expect the software to hit the streets after the basic version of NT Server 5.0 ships, and that is not expected to happen until late this year. ■

Stiff competition

While Windows NT will have a presence in 95% of corporate networks by the year 2000, the product still will face some stiff competition for dominance in those shops.

Intel-based OS threats, 1998–1999	**Intel-based OS threats, 2000–2005**
1. NetWare	1. SCO UnixWare
2. SCO UnixWare	2. NetWare
3. SCO OpenServer	3. Other Intel Unix, such as Linux
RISC-based OS threats, 1998–1999	**RISC-based OS threats, 2000–2005**
1. Sun Solaris	1. Sun Solaris
2. HP-UX	2. HP-UX
3. IBM AIX	3. IBM OS/400

SOURCE: GARTNER GROUP, STAMFORD, CONN.

WIRED WINDOWS

Novell's new database plumbing

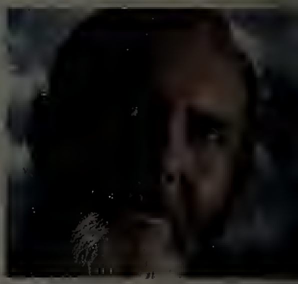
Novell's former CEO, Ray Noorda, used to sometimes refer to himself as a plumber. By that he meant that he saw Novell as a connectivity company, "connecting everyone to everything," as he put it.

Unfortunately, Novell (and Noorda) lost that vision and entered into the fight-Microsoft-at-every-level battle. It lost decisively.

But, as I said last month (*NW,* Dec. 15, 1997, page 18), Dr. Schmidt has brought the connect-everything ethic back to Provo.

The latest indication of that is a product due out late this year tentatively called Database Manager for NetWare. While the rationale for the product is the explosive growth of the World Wide Web, you don't need to run an active Web site to appreciate the benefits it brings. Essentially, it allows multiple databases from multiple vendors to appear to be a single data source. The initial release will support database products from Oracle, Microsoft (SQL Server), Sybase, IBM (DB2), Informix and Ingres. It also will support flat files in standard formats (comma or column delimited).

When I was an IS manager, I firmly believed that you should pick the best application, then pick that application's best platform. This meant that our manufacturing and sales facility supported Oracle, Sybase, Btrieve, Clarion and SQL Server databases. I kept three full-time database programmers busy finding ways to move data back and forth among these systems and present data to users from multiple systems simultaneously.



Dave Kearns

With a tool such as the proposed Database Manager for NetWare, I likely could have gotten by with one full-time and one part-time programmer.

Much of the present-data-to-users work would involve setting up a data dictionary combining all of the various databases, then showing the user how to access it with the various Microsoft Office products they already are familiar with. That is much easier than having to build custom applications for almost every query, which for the most part involved pulling data from disparate systems into a lowest common denominator database system before invoking the query.

There is a lot more to Database Manager for NetWare, and if you subscribe to Novell's "Developer Notes," you'll find it in the January issue. If you don't subscribe, wait a couple of weeks and you can read it online.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

Have you ever wondered if you're really cut out to be an information technology worker? Or, if you know you belong in IT, are you in the right facet of IT? Would you be better off as a programmer, graphic artist, network technician or technical writer?

Microsoft has teamed up with the NorthWest Center for Emerging Technologies and the Regional Advanced Technology Education Consortium to create an online skills assessment aptitude tool. Find out what you're cut out for — take the test at http://partnering.microsoft.com/skills2000/default.asp.

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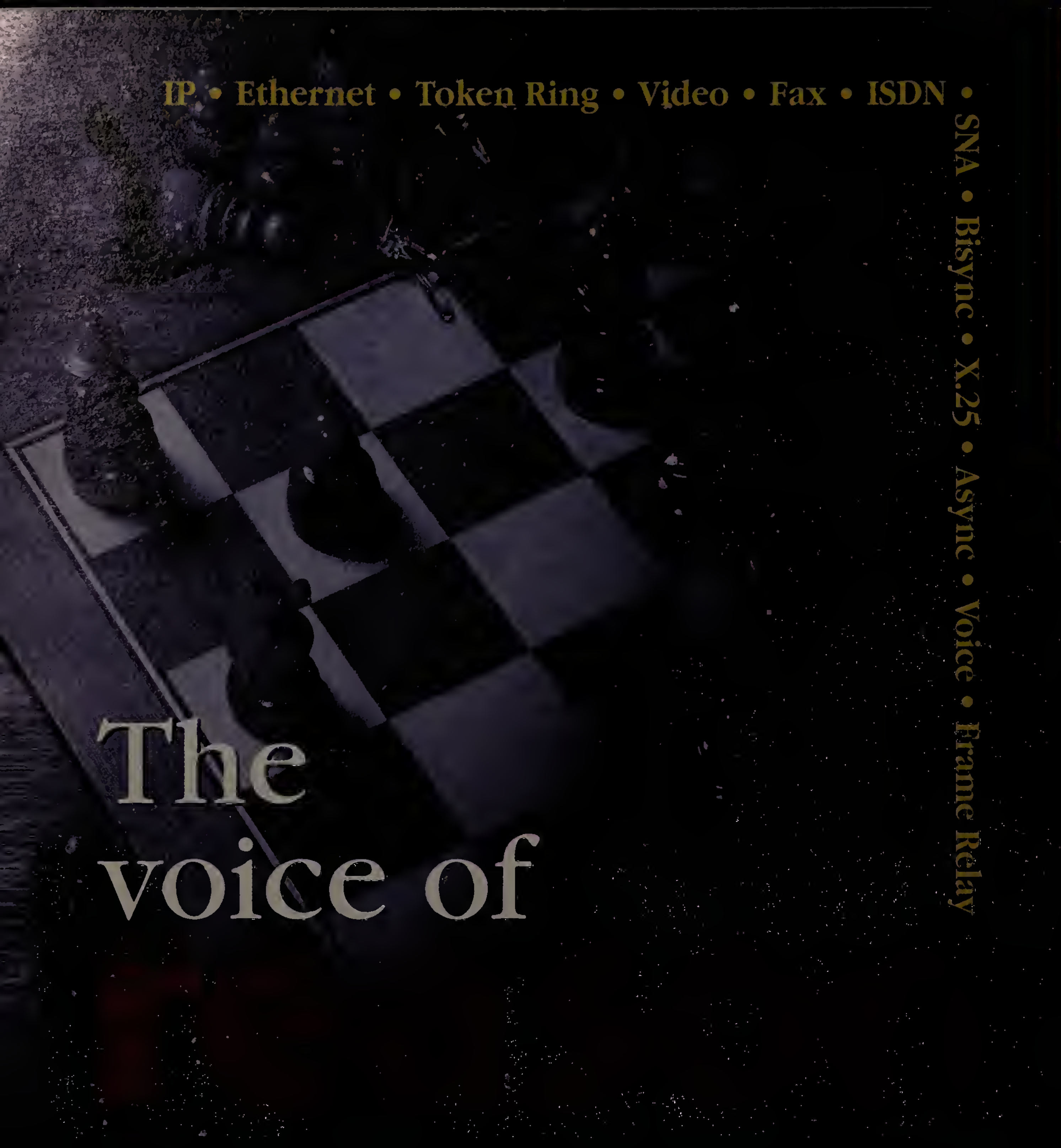
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*Circle Reader Service #**10***

▶ *"Bright Tiger has hit a market problem head-on that is just starting to emerge."* – Peter Cowie, President, Charter Systems Corp.

GENERATION NEXT

Building a distributed server infrastructure for business-critical web applications requires a new breed of tools to shield users from the complexity

Pain is an all-too-familiar sensation to IS organizations, and the pain associated with migrating from mainframes to client/server and most recently to a web-based environment is – and continues to be – acute. Although web pain has been largely low level to this point, the explosion of the Internet and intranets is finally creating a backlash. Users are becoming increasingly frustrated as their business processes are impaired by low network availability, low application availability and poor performance.

This frustration is mounting as access times grow and the number of router hops required for web traffic multiplies. The result is increased pressure on large end users building intranets, companies that host web sites, integrators and developers. All of these groups depend on distributed, business-critical web applications that let them access content, application and transaction resources. All require server infrastructures with high performance and availability.

A high-volume, on-line publisher and service provider with multiple web and database servers is hosted at a single East coast location. Due to the distributed topology of the Internet, it takes the publisher's West coast users significantly longer to access its web servers than their East coast counterparts. Specifically, West coast users are 15 to 20 router hops away, while East coast users require only four to eight hops. The cumulative effect of these router hops on response time for West coast users can be up to five to 10 seconds longer.

As a result, this technology holdup becomes a revenue issue because the publisher is unable to provide prompt service to its pipeline of outgoing ads. The publisher is also plagued by a content management problem as it attempts to distribute and synchronize content across the Internet's geographically distributed infrastructure.

Then there's a global professional services firm, which is aggressively web-enabling itself and its worldwide operations. In the course of this strategy, it has developed "Knowledge Spaces," primarily internal information resources for different parts of the firm such as consulting and accountancy. Each Knowledge Space is hosted on a single web server with a back-end database. Although the company uses its own private intranet backbone network, traffic from many domestic and international nodes is routed across a time-consuming maze of connections before it reaches the Knowledge Space corporate servers. The firm needed a means to dramatically improve response time as well as manage and speed network access.

OPPORTUNITY AND DEPLOYMENT COSTS

The problems experienced by these two companies are not uncommon. Invariably, these types of problems translate into two forms of costs: the deployment costs of hosting mission-critical applications on the web (including additions to personnel, servers and wide-area network bandwidth) and opportunity costs (losses in productivity, customer satisfaction and, ultimately, revenue).

Increasingly, web deployment calls for more dynamic, personalized content and database-driven electronic commerce applications. In these environments, download times often skyrocket – up to a minute at some of the most popular sites – and greater application complexity is a given. No longer is it a case of the web server simply accessing static files. Now the server accesses databases and in some cases application servers that are logically part of the server infrastructure.

To accommodate this challenge there has been a shift from two-tiered architectures to "n"-tiered client/server architectures using browser-based clients and web, application and database servers. In turn, personnel costs associated with deploying and managing infrastructures have increased. This escalation in architectural complexity and personnel is placing a heavy burden on web-server-dependent organizations.

Opportunity costs extract an equally unacceptable heavy

DIGEX "Rocks" With Bright Tiger

"It rocks," is how Alan Thompson, a product engineer at Washington, D.C.-based DIGEX, Inc. evaluates Bright Tiger Technologies' ClusterCATS server access and management software. "I know of no other product that provides the same features."

Thompson works for the web site management division of DIGEX, a national ISP with a dually redundant, clear channel, DS-3 network. Many of his high-end business customers rely entirely on their mission-critical web sites for their companies' revenues, so he can't afford to take a chance with their investments. That's what got him interested in ClusterCATS in the first place.

Now if a user in Seattle attempts to access a company's web site hosted at DIGEX's new West coast server facility in Cupertino, Calif., and for any reason that server is unavailable, ClusterCATS automatically and transparently sends the user to the company's Washington, D.C., server. Once the Cupertino server is back online, it automatically supplants its East coast counterpart.

That's the macro view. What impresses Thompson are the details, starting with the product's monitoring capabilities. "ClusterCATS monitors applications, local services, tables and graphics, and local or remote files," he says. "If you have a back-end database server that goes down, ClusterCATS would notice and proactively and transparently redirect clients to another web server."

Thompson also acknowledges the value ClusterCATS brings to server maintenance. "If you have to change out a hard drive, you can be confident you can take down your West coast web server and the East coast server will make sure that content is still available to your customers."

Prior to implementing ClusterCATS, DIGEX used a mix of local and distributed server products, such as DistributedDirector and LocalDirector from Cisco Systems, Inc. in combination with the content replication capabilities of Microsoft's Site Server. "That approach worked very well, but it didn't take into account server application failure or content dependencies such as databases, local processes or files," Thompson says. "ClusterCATS gives you more of a solution, and it can be combined with both local and distributed server access and management products. Using a hardware solution alone wasn't effective enough."

Does Thompson believe ClusterCATS can produce a solid ROI? "It depends on how much it costs every second your web site is down," he says. "If you have a commerce site and it's down for an hour because of server failure, the ROI becomes apparent very quickly."

toll on corporate coffers by alienating potential customers, especially in electronic commerce environments. Most customers won't come back a second time if their initial experience with a commerce server is negative. Given that the experience of most people is with the two- to three-second response times of mainframe-based reservation systems, their attitudes are understandable. Also, when intranet servers are slow to respond, there can be serious ramifications because many companies must uphold internal service-level agreements.

These opportunity costs can be recovered only when an order-of-magnitude improvement is brought to business-critical web applications. Deployment costs can only be lessened when the exponential increases in users, information and architectural complexity are brought under control.

OPTIMIZING SERVER ACCESS

There are four critical factors that must be realized to optimize web server access and performance: reliable access, rapid access, right information and resource effectiveness. Reliable access entails complete end-to-end access, including databases, applications and files. This means detecting problems and shielding users from them by transparently redirecting users to a second source. Rapid access is optimized by directing users transparently to the closest web server that meets their needs. For the right information to be reliably available, information updates must be synchronized within distributed infrastructures, ensuring that the outside world has only one view of the information at a given time. And finally, resource effectiveness refers to the optimal deployment of WAN bandwidth, personnel and servers. If the balance between these components is optimized, so too is network and application performance as well as application availability.

Additionally, there are four primary causes of low availability and poor performance that need to be addressed: failed or overloaded server hardware; network failures, network congestion or long network routes; failed or missing software resources, such as applications, databases and files; and system downtime caused by human error or scheduled maintenance.

℞ FOR RELIEF: THE FOUR 'Rs'

There are four critical factors to optimize web application availability and performance. These factors include:

- **Reliable access**
- **Rapid access**
- **Right information**
- **Resource effectiveness**

CAUSES OF LOW AVAILABILITY AND POOR PERFORMANCE

There are four primary causes of low web application availability and poor performance:

- **Failed or overloaded server hardware**
- **Network failures, network congestion or long network routes**
- **Failed or missing software resources, such as applications, databases and files**
- **System downtime caused by human error or scheduled maintenance**

In most cases, both server hardware and the network are resilient, which translate into a high percentage of up time. But software – specifically as it relates to content, applications and transactions – is a weak link and the most likely source of failure. Human error, attributable to administrators, is another area of likely failure. Risky operations conducted by administrators include taking servers down for maintenance and updating content across the infrastructure without reliable backup.

To minimize problems associated with downtime while achieving high availability, it is necessary to take a systematic approach that includes detecting problems, alerting administrators, shielding users from problems and providing historical report information that can be used to prevent future problems. Detecting and shielding are the two most mission-critical elements in this equation.

To date, there have been two basic approaches to overcoming poor web server availability and performance. The first approach features a distributed delivery strategy with completely redundant, mirrored servers and resources that are "local" to users. The second approach uses a centralized delivery strategy with redundant, mirrored servers and resources.

Unfortunately, the current tools used to implement these approaches are incomplete and too passive for their high-demand environments. Not only are they unable to detect all performance and availability problems associated with networks, servers and resources, but they are unable to transparently shield users from problems other than failed or overloaded web server hardware. In addition, both approaches are expensive and difficult to implement.

CURING INFRASTRUCTURE ILLS

It may be too late to forestall a crisis in network and web application performance, but it's certainly not too early to seek relief for these critical infrastructure ills. The antidote may be a new category of products referred to as "infrastructure deployment tools." Today only one company offers a complete suite of these emerging tools.

GENERATION
NEXT

In response to the rapidly increasing demand for access to geographically dispersed servers, Bright Tiger Technologies in Acton, Mass., has created ClusterCATS. ClusterCATS is a family of server-side software tools that enables enterprise IS organizations, web site hosting companies and integrators to build and control highly available, high-performance distributed server infrastructures for business-critical web applications. ClusterCATS builds SmartClusters, a group of two or more distributed web servers that can be clustered at one location on a local-area network or globally dispersed on a WAN. In either case, the SmartCluster operates as a single entity to ensure user access to content, application and transaction resources. ClusterCATS ensures users can rapidly and reliably access information and complete transactions – including electronic commerce – at their intranet or Internet site.

The Bright Tiger software conducts a series of interconnected operations that optimize server access and performance. The software automatically and transparently:

- ▸ Monitors server load and the status of content, application and transaction resources
- ▸ Calculates network distances between users and servers
- ▸ Manages content distribution and synchronization
- ▸ Intelligently directs user access within a SmartCluster.

The intelligent, proactive features of ClusterCATS make it unique. It identifies the location and availability of back-end content and transaction resources, including databases, applications and files. In the case of failed or unavailable servers, it proactively redirects requests to the closest, least loaded server with the appropriate user content, resources and processes.

ClusterCATS is also scalable to meet the needs of a wide audience. At the low end, it bolsters web site hosting companies supporting small businesses on single physical servers. On an enterprise level, it supports intranet/extranet/Internet applications using a single SmartCluster of distributed servers at many geographically remote locations.

It appears that Bright Tiger has delivered the right product at the right time. "These guys are solving a problem that companies don't have a solution for," says Peter Cowie, president of Charter Systems Corp., a systems integrator in Newton, Mass. "Bright Tiger has hit a market problem head-on that is just starting to emerge." ✻

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Briefs

■ *At ComNet '98 this week,* **Micromuse, Inc.** *will announce Netcool/Internet Service Monitors, a suite of applications for measuring* **Internet service response time** *and availability.*

Netcool/Internet Service Monitors manage seven Internet services: HTTP, File Transfer Protocol, Simple Mail Transfer Protocol, Post Office Protocol 3, Network News Transfer Protocol, Domain Name System and Remote Authentication Dial-In User Service.

In addition to collecting response time and availability data, Netcool/Internet Service Monitors forward the data to a central repository. This allows network administrators to view the status and performance of Internet services and other network events from one screen.

The suite will ship in the first quarter of 1998. The seven-application suite costs $20,000, or $7,000 per application.

© Micromuse: (415) 538-9090

■ *The* **Microelectronics Group of Lucent Technologies, Inc.** *has developed a new digital subscriber line (DSL) chipset, dubbed* **WildWire.** *The company claims the chipset will allow remote users to install a DSL connection without the need for additional equipment or modified wiring in their remote offices.*

DSL promises to squeeze extra bandwidth out of analog phone lines. While current analog modems top out at about 56K bit/sec, Lucent's DSL technology will offer download speeds of up to 1.5M bit/sec, the company said.

To use DSL, customers presently must have additional wiring, or splitters, installed at their remote offices to separate voice and data traffic. With WildWire, Lucent claims that will no longer be necessary.

Sample WildWire modems for remote PCs are expected to begin shipping in the third quarter of 1998, Lucent said.

© Lucent: (908) 582-8500

ACT makes it easy to link voice/data nets

New gateway switch fills out company's Universal Access Architecture plan.

By Tim Greene

Camarillo, Calif.

ACT Networks, Inc. at ComNet '98 this week, will introduce gear that makes it easier for users to link voice and packet-based data networks.

ACT will introduce and demonstrate the MSX-5400, a gateway switch that enables voice traffic to traverse IP and frame relay networks. The idea is to let users save money by combining their voice calls with existing data nets.

The MSX-5400 would sit next to a PBX in a corporate network and support connections to IP or frame relay networks.

The MSX-5400 could be used to make phone calls to other sites in a corporate IP or frame relay network. The caller would pick up the phone and dial the desired number. The PBX would route the call to the MSX-5400, which would perform address translation and route the call over the corporate IP or frame relay network.

> *With ACT's gear, users can consolidate their local traffic — voice, video, IP and SNA — onto dial-up, dedicated, wireless or satellite links.*

The device also could be used to complete Internet phone calls. For example, a remote Internet user equipped with a PC, microphone and speakers could hit a corporate Web site that featured an option to talk to someone live.

Users would click an icon, and IP telephony software from Netspeak Corp. would be downloaded to them. That would automatically set up a session with an MSX-5400.

The MSX-5400 would route the call to a PBX, which would complete the call to a private voice network or the public phone network. The Internet caller could then talk to someone while viewing the Web page online.

The MSX-5400 has four slots that can support analog or digital voice cards, an ethernet card and a single T-1 or E-1 wide-area link. It also supports up to three Basic Rate Interface ISDN lines.

The new products fulfill ACT's announcement last year of its Universal Access Architecture (UAA), a network scheme that supports multiple traffic types over multiple wide-area links (*NW,* Sept. 15, 1997, page 66).

With UAA, users can consolidate their local traffic — voice, video, IP and SNA — onto dial-up, dedicated, wireless or satellite links.

That immediately saves the user money by eliminating other parallel networks that handle only one type of traffic.

If service providers buy into UAA, customers can further streamline their network. Rather than trying to link all sites in a corporate network using one access technology, they can use whatever makes the most sense for each individual site.

For example, using an ACT switch, all the traffic from a site connected by a dial-up connection could be switched through the carrier network and delivered to sites connected by frame relay or satellite.

ACT also will announce and demonstrate AVI-2000, a standalone device that connects video codecs to frame relay networks to let users flow video over a packet-based net.

The MSX-5400 is expected to ship in the second quarter of 1998. The price was unavailable. The AVI-2000 will have a base price of $3,000 and will ship by early March.

© ACT: (805) 388-2474

RND balances distributed server traffic

Company's Web server package ensures high availability.

By Jim Duffy

Washington, D.C.

At ComNet '98 this week, RND Networks, Inc. will take the wraps off a new version of its IP load-balancing servers, including one that is designed for distributed environments.

That's a load of . . .

RND's Web Server Director Distributed Sites:

- Load balances distributed IP server farms
- Detects server/site failure for up to 512 logical server farms
- Is priced from $16,400 to $22,500 and is available now

The company's Web Server Director Distributed Sites (WSD-DS) is a hardware device that allows users and service providers to balance IP traffic load between distributed server farms to ensure high availability. This enhances quality of service by transparently redirecting intranet and Internet clients to optimal server destinations when primary servers are down or busy, RND said.

For example, WSD-DS at a site in New York can redirect traffic to Paris or Los Angeles based on a user-defined traffic saturation point. Also, if the New York site is disabled, users will receive service from other locations without disruption.

WSD-DS hardware is based on an Intel Corp.-based Reduced Instruction Set Computing platform. It sports two or four Ethernet ports, or two Fast Ethernets for server and LAN attachments. WSD-DS devices also employ an RND proprietary load reporting protocol to communicate load information to one another.

Software for the WSD-DS servers allows users to define traffic thresholds by which devices redirect traffic.

These thresholds, called "user-defined weighting" by RND, can be applied to each server or server farm.

Traffic control

WSD-DS refers to these weighting thresholds during traffic redirection to ensure that no site or individual server is overloaded by user requests.

If an Internet service provider has major sites in several physical locations, each site can be configured to redirect traffic to another site in the network once the site reaches a predefined traffic threshold.

Traffic will be forwarded to this alternate site until the redirecting site traffic load drops within acceptable operating ranges.

User-defined weighting enables WSD-DS devices to provide load balancing and server/site failure detection for up to 512 logical server farms, RND said. WSD-DS also lets users retain legacy equipment and extend the life span of existing servers by relieving them of some or most of the IP traffic load.

Pricing for WSD-DS starts at $16,400 for Ethernet. The Fast Ethernet version costs $22,500.

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Go online for:

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- Vendor product specifications
- A look at the Web server farm IBM set up for the 1996 Summer Olympics

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INTERNETWORKING MONITOR

Network management: The State of the Union

As I prepared for this week's Network Management Showdown at ComNet '98, I was struck by the fact that I don't know the network management systems anywhere near as well as I know the products they are meant to manage.

The reason is that, in the past at least, cost and complexity have kept high-end network management systems out of my test lab and many customer networks.

Six figures was often the opening charge in the network management game. And that might barely get you started. For many network managers, a cure this costly is many times worse than the ailment. And money wasn't the end of it.

Perhaps fittingly, managing complex networks was a complex undertaking. From my experience, running such systems required skilled personnel, highly trained on the individual management platform. Such was the complexity that the individual who actually had some grip on all of the elements was often accorded high priest status.

But times do change, and this is as good a time as any to look again and see if network management really is ready for the enterprise network — and vice versa.

Kevin Tolly

As in so many areas, the influence of the Internet may make for radical change. A primary rationale behind many network managers' moves to a high-end net management system was device configuration and management.

While trouble ticket and other "help-style" functions are popular these days, let's face it, network managment still is fundamentally about manageing network devices.

Vendors of hubs, bridges, switches and routers were consistently inconsistent with device configuration interfaces. The big vendors are not excluded from this assessment. Anyone who ever went face-to-face with one of these beasts knows exactly what I'm talking about. The human interfaces were just plain bad.

As devices of ever more sophistication were launched into the marketplace, you could be sure of one thing: They would be configured by a pathetic VT-100 terminal interface. That is, until lately.

No sooner had the Web browser been crowned the universal access mechanism than Web-based management started showing up in literature for devices such as LAN switches. As often happens, it sounded too good to be true. Only this time, it worked.

It is often said that the Internet was always a treasure trove of information but the browser is what really unlocked it. One can make the same statement about device management. The information was always there — it was simply too difficult to manipulate and monitor.

So vendors, are your high-end systems merely carrying on a now-antiquated, pre-Web approach to device management? With Web-based packages available built in to more and more devices, how will you justify charging for that function?

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300 or via the Internet at ktolly@tolly.com or www.tolly.com.

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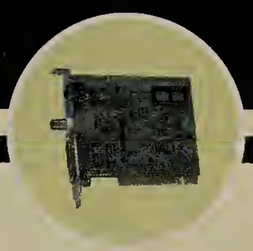

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D-Link	—	—	✓	✓
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*Circle Reader Service #**21***

Briefs

■ *The emerging national broadband carrier* **IXC Communications, Inc.** *has inked a deal with commercial reseller* **UniDial Communications, Inc.** *to create a joint sales force called UniDial Direct. The 200-member force, based in 50 metro markets, will attempt to cut through red tape for users via an* **intranet-based customer service record system.** *IXC is one of three new national carriers racing to complete networks to compete with the big long-distance carriers and erase the current wide-area bandwidth crunch (NW, Jan. 12, page 10).*

■ **Frontier Corp.** *has agreed to pay $185 million in stock to purchase* **Global Center, Inc.,** *a high-end Web hosting service provider.*

GlobalCenter, of Sunnyvale, Calif., offers Web site distribution services for high-profile Internet customers such as Netscape Communications Corp., Yahoo!, USA Today and Playboy. Frontier, based in Rochester, N.Y., offers local, long-distance, wireless, data and Internet services.

■ **NetCentric Corp.** *recently struck a deal with* **STF Technologies, Inc.** *to integrate STF's FAXstf Macintosh fax software with NetCentric's FaxStorm Internet Fax System. This will allow FAXstf Mac customers to* **use Internet fax services** *that are based on NetCentric's technology. Internet service providers, such as PSINet, Inc. and ANS Communications, Inc., use NetCentric technology.*

NetCentric also announced its FaxStorm Connector, which was jointly developed with Omtool. The FaxStorm Connector will let Omtool LAN Fax Sr 2.5 customers connect their existing fax server to the Internet.

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RBOCs should move slowly toward long distance

By Sandra Gittlen

Regional Bell operating companies should be kept out of long distance until they open their doors to local competition.

This was the resounding opinion from participants squaring off against executives from MCI Communications Corp. and BellSouth Corp. in a two-week online conference hosted by Network World Fusion. The Fusion Face-off asked participants to debate whether RBOCs should be allowed to enter the long-distance market.

"To me the situation is clear and simple: Once I have a choice of local providers, then the RBOCs can join my choice of long-distance providers," said George Nincehelser, an independent network consultant and Face-off participant.

MCI echoed the sentiment, saying BellSouth needs to adhere to the 1996 telecommunications act before moving ahead.

"Section 271 of the Telecommunications Act of 1996 sets out the process by which the RBOCs must open their local monopolies before they are allowed into an already competitive industry," said Chip Casteel, regional executive of public policy at MCI. "But they don't want any rules to govern their behavior, despite the fact that they still control 99% of the local phone market."

BellSouth countered, saying that keeping it from long distance is putting the company at a significant market disadvantage — and is anticompetitive.

"We can package local voice and data, wireless, residential and business Internet access and cable, and follow our customers with those services across the country and across the globe," said Randy New, vice president of legislative implementation at BellSouth.

"The missing piece that will allow us to attractively and affordably package services to customers is long distance," he said.

New also claimed that allowing RBOCs into long distance could reduce rates by as much as 15%.

But some conference participants contended that the RBOCs' entrance into long distance would mean refocusing on plain old telephone service and would be a move away from the advances that long-distance providers have made in the wide area, such as frame relay.

Participants also charged the RBOCs with potentially having an even greater monopoly: specialized rates for frame relay and similar services.

Casteel claimed RBOCs have the advantage because of the dedicated-access facilities they control.

But one participant argued that the RBOCs are at a disadvantage locally because they are subject to state rate setting.

"I believe there is going to continue to be this huge discrepancy until the IXCs and [competitive local exchange carriers] establish a facilities-based competition. And the only way to encourage that action is to allow the RBOCs to compete fully," said David Brockman, a forum participant.

Hop online this week for our conference on the Department of Justice vs. Microsoft Corp. Dave Kearns and Mark Gibbs, two Network World *columnists, will face off against each other and readers. DocFinder: 5511.*

www.nwfusion.com

Get more online:

5426

- Read all the Face-off comments for yourself
- Results from our survey on telecommunications competition
- A copy of the recent court ruling on RBOCs and long-distance services

Fusion

AT&T gets bigger, better Internet services with TCG

Pending acquisition gives AT&T 57 local nets and an established Internet business.

By Denise Pappalardo

AT&T's pending $11 billion acquisition of Teleport Communications Group (TCG) will bring in 57 local networks that will benefit AT&T's primary long-distance services business, as well as its expanding Internet business.

AT&T WorldNet and TCG Cerfnet, the Internet service provider units of the respective companies, have national networks, offer managed services and share a solid focus on the business market. But the ISP businesses differ in size and scope.

AT&T WorldNet, like the rest of AT&T, will benefit from TCG's local networks. AT&T WorldNet's access to the local networks will translate into better quality of service for WorldNet business customers, said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm.

AT&T WorldNet will have more control over its customers' dedicated Internet connections because it will be able to manage these links from its Internet backbone all the way to the customer premises, Wetzel explained. Today, WorldNet relies on incumbent local exchange carriers or on competitive LECs such as TCG to provide the local portion of the connections to WorldNet business customers.

"TCG [Cerfnet] is a plum for AT&T," Wetzel said. "From the customer's perspective, it's very useful to have control over the entire dedicated connection, especially if this customer is using a VPN [virtual private network] service," she said. Customers are waiting to see what VPN advantages are coming down the pike.

"We are talking to AT&T and other ISPs about VPN services," said Jim Fey, director of strategic technology at PMI Mortgage Insurance Co., in San Francisco. AT&T should be able to offer a better circuit price for its VPN service if it owns the local loop, instead of just negotiating the best deal with Pacific Bell, Fey said.

New services

Not only will AT&T WorldNet be able to offer more robust services, it also will be able to offer new services. Through its acquisition of TCG, AT&T will be able to support integrated services that offer users a true one-stop shop for all their telecom needs.

In fact, TCG Cerfnet's service developments last year will help AT&T once the merger is final. Late last year, TCG Cerfnet introduced integrated services that let users support local voice and Internet traffic over a single T-1 or ATM dedicated connection. Analysts believe it will be at least one year before AT&T will offer such a service. ■

WORLDNET'S AND CERFNET'S INTERNET ASSETS

ISP	AT&T WorldNet	TCG Cerfnet
Number of points of presence	580	32
Number of network operations centers	2	2
IP backbone	ATM, 155M bit/sec	ATM, 155M bit/sec

EYE ON THE CARRIERS

Sprint's missed opportunity

Lost in the hoopla surrounding AT&T's acquisition of competitive local carrier Teleport Communications Group is the fact that Teleport originally was supposed to wind up with another long-distance carrier.

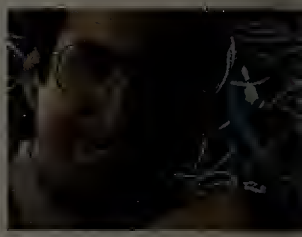
In 1994, Sprint announced a far-reaching alliance with the three cable companies that owned most of Teleport. There were two big ideas behind the alliance. First, Sprint and the cable companies would create a venture to bid for digital wireless licenses from the federal government and become the biggest player in personal communications services (PCS). That they've done.

Second, the cable companies would fold Teleport into the new venture and convert their own cable lines to two-way telephony. Together with Sprint long distance, the venture would then sell end-to-end voice and data services under the Sprint brand. That never happened.

What went wrong? For one thing, the cable companies became entranced by the idea of cable access to the Internet. They became loath to see that opportunity go to market under the Sprint name, and the landline side of the joint venture collapsed.

But perhaps more important, the Sprint PCS license payments, network build-outs and marketing efforts started chewing up gobs of management attention and billions of dollars in capital.

Sprint PCS, sold like cellular service in partnership with mobile phone manufacturers, has been a hit among consumers. But its impact on enterprise networking has been close to zilch.


David Rohde

All this presents a dilemma for Sprint users. Take Dawn Sutherland, who is a big fan of Sprint's frame relay service. As network administrator for Atlanta-based Regency Realty Corp., a commercial real estate management firm, she has been besieged with offers from new local carriers to drop BellSouth for dedicated access lines. So she recently asked her Sprint representative if Sprint had any local service on tap in Atlanta and other Southern cities.

His answer: "We haven't jumped into local because we've watched MCI lose $800 million there. We're working on it, but there's no way we want to be in the same condition MCI is in now."

It would be interesting to hear Sprint CEO Bill Esrey's proposal on how to build your own local networks and not lose money. Neither MCI, MFS, Teleport nor any other facilities-based new local carrier that I know of has made a profit on local service. As for MCI's condition, Bernie Ebbers sure doesn't think the company is in that bad a shape or he wouldn't have paid a 50% premium over MCI's stock market price.

Sprint's typical response to all this is to boast that it already is a local carrier in some smaller cities around the country. But that does not amount to anything as a national strategy.

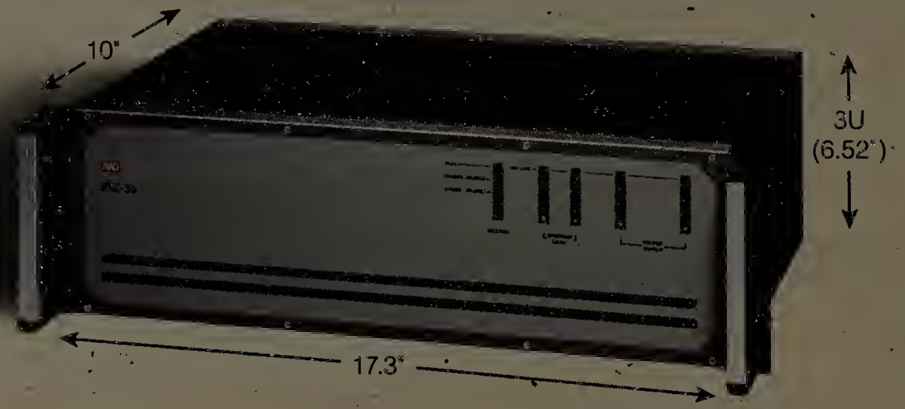
Basically, Sprint is making the same mistake British Telecommunications made when it panicked and lowered the price it was willing to pay for MCI. Sprint and BT mistook initial local market operating losses for a bad investment.

Neither AT&T nor MCI see it that way anymore. It would be a shame if Sprint squandered its hard-won victories in data services by failing to complete the local loop.

Rohde is Network World*'s senior editor, Carriers & ISPs. He can be reached at david_rohde@nww.com.*

Headline: Put T1, Sub T3 and Full 10M Ethernet over Fiber and Copper T1 Links

Photo:



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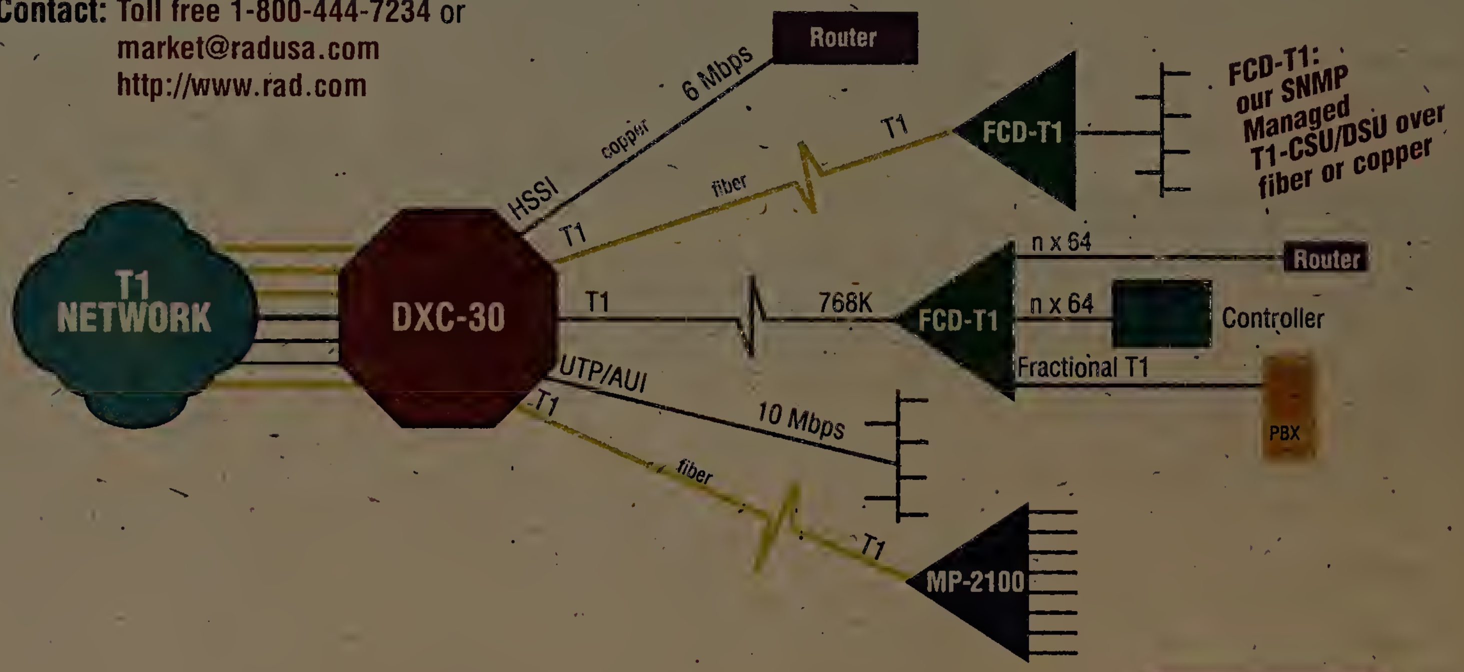

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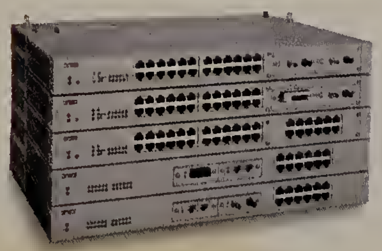

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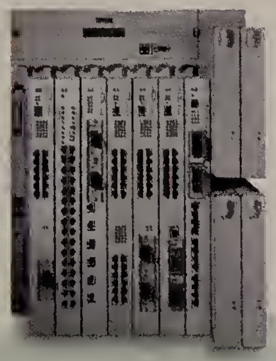

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Form: 9702

1 What is the principal business activity at your location? (check one only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consulting (Independent)*
16. ☐ Carriers/Interconnects
17. ☐ Internet Service Provider (ISP)
18. ☐ Manufacturing (Computer/Communications/OEM)
19. ☐ Resellers of Computer/Network Products (VARs, VADs)
20. ☐ Systems/Network Integrators*
21. ☐ Distributors (Computer/Communications)*
22. ☐ Other *(please specify)*

*Please complete form based on largest client.

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, CIO, Systems Management
5. ☐ Internet/Intranet Management/Webmaster
6. ☐ Engineering Management
7. ☐ Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management)
8. ☐ Consultant (Independent)
9. ☐ Other *(please specify)* ______________________

3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code in the box next to each product category. Please complete ALL categories A-M.)

1. $50 Million or more
2. $25 Million to $49.9 Million
3. $10 to $24.9 Million
4. $1 to $9.9 Million
5. $100,000 to $999,999
6. $50,000 to $99,999
7. Under $50,000
8. None of the above

A ☐ Large Systems *(Mainframes/Minis)*
B ☐ Desktops *(Micros/Laptops/Workstations)*
C ☐ Servers
D ☐ LANs
E ☐ WAN Equipment
F ☐ Carrier Services
G ☐ Internetworking
H ☐ Internet
I ☐ Intranet
J ☐ Remote Access
K ☐ Peripherals
L ☐ Software
M ☐ Service/Support

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

SERVERS			CLIENTS			LANS		
At Location A		Entire Org. B	At Location C		Entire Org. D	At Location E		Entire Org. F
☐	1. 50,000+	☐	☐	1. 50,000+	☐	☐	1. 50,000+	☐
☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐
☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐
☐	4. 100 to 999	☐	☐	4. 100 to 999	☐	☐	4. 100 to 999	☐
☐	5. 50 to 99	☐	☐	5. 50 to 99	☐	☐	5. 50 to 99	☐
☐	6. 10 to 49	☐	☐	6. 10 to 49	☐	☐	6. 10 to 49	☐
☐	7. 1 to 9	☐	☐	7. 1 to 9	☐	☐	7. 1 to 9	☐
☐	8. none	☐	☐	8. none	☐	☐	8. none	☐

6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve
4. ☐ Evaluate
5. ☐ Determine the need
6. ☐ None

7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

A. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

B. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

8 Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing B. Plan to purchase

INTERNET/INTRANET
A B
☐ 01. ☐ Internet Services
☐ 02. ☐ Firewalls/Security/Encryption
☐ 03. ☐ Internet Web Servers
☐ 04. ☐ Intranet Web Servers
☐ 05. ☐ TCP/IP Software
☐ 06. ☐ Management/Monitoring Software
☐ 07. ☐ Push Technology
☐ 08. ☐ Web Browsers
☐ 09. ☐ Intranet Applications/Groupware
☐ 10. ☐ Search/Retrieval Products (web crawler)
☐ 11. ☐ Internet Development Tools (JAVA, ActiveX, etc.)
☐ 12. ☐ Electronic Commerce Tools
☐ 13. ☐ Internet Telephony

LOCAL-AREA NETWORKS
A B
☐ 14. ☐ Local-Area Networks
☐ 15 ☐ Network Operating System Software
☐ 16. ☐ Servers
☐ 17. ☐ Print Servers
☐ 18. ☐ ATM Switches
☐ 19. ☐ Token-Ring Switches
☐ 20. ☐ Ethernet Switches
☐ 21. ☐ Fast Ethernet
☐ 22. ☐ Gigabit Ethernet
☐ 23. ☐ IP Switches
☐ 24. ☐ LAN Storage/Backup
☐ 25. ☐ Optical LAN Storage/Backup
☐ 26. ☐ Disk LAN Storage/Backup
☐ 27. ☐ Tape LAN Storage/Backup
☐ 28. ☐ RAID LAN Storage/Backup
☐ 29. ☐ Network Test/Diagnostic Tools
☐ 30. ☐ Cables, Connectors, Baluns
☐ 31. ☐ UPS
☐ 32. ☐ Network Interface Cards
☐ 33. ☐ SNMP Network Management

INTERNETWORKING
A B
☐ 34. ☐ Routers
☐ 35. ☐ Hubs
☐ 36. ☐ Intelligent Hubs
☐ 37. ☐ Stackable Hubs
☐ 38. ☐ Bridge/Router
☐ 39. ☐ Bridges
☐ 40. ☐ Gateways
☐ 41. ☐ Concentrators/Repeaters

COMPUTERS/PERIPHERALS
A B
☐ 42. ☐ Network Computers
☐ 43 ☐ Laptops/Notebooks/Sub-Notebooks
☐ 44. ☐ Micros/PCs
☐ 45. ☐ Minis
☐ 46. ☐ Mainframes
☐ 47. ☐ Workstations
☐ 48. ☐ Printers/Network Printers
☐ 49. ☐ CD-ROM
☐ 50. ☐ Fax/Modem Boards
☐ 51. ☐ Graphics/Multimedia/Audio/Video Boards
☐ 52. ☐ Memory/Chips/Boards/Cards

REMOTE/WIRELESS COMPUTING
A B
☐ 53. ☐ Remote Access Products
☐ 54. ☐ Remote Access Services
☐ 55. ☐ PDAs
☐ 56. ☐ PCMCIA Devices
☐ 57. ☐ Wireless Data Services
☐ 58. ☐ Wireless Data Equipment
☐ 59. ☐ Cellular Equipment & Services

SOFTWARE/APPLICATIONS
A B
☐ 60. ☐ Network Management
☐ 61. ☐ Systems Management
☐ 62. ☐ Security
☐ 63. ☐ Communications Software
☐ 64. ☐ Terminal Emulation
☐ 65. ☐ Operating Systems
☐ 66. ☐ Applications Development Tools
☐ 67. ☐ Database Management/RDBMS
☐ 68. ☐ Groupware
☐ 69. ☐ Workflow
☐ 70. ☐ EDI
☐ 71. ☐ E-mail
☐ 72. ☐ Desktop Video Conferencing
☐ 73. ☐ Imaging
☐ 74. ☐ Suites/Server Suites (Back Office, etc.)
☐ 75. ☐ Middleware
☐ 76. ☐ Document Management
☐ 77. ☐ Site Metering Tools
☐ 78. ☐ Computer Telephony Integration (CTI)
☐ 79. ☐ Data Warehousing

WIDE-AREA NETWORK EQUIPMENT & SERVICES
A B
☐ 80. ☐ Modems
☐ 81. ☐ Asynchronous Transfer Mode (ATM)
☐ 82. ☐ Frame Relay Equipment/Services
☐ 83. ☐ ISDN Equipment & Services
☐ 84. ☐ FT-1/T-1/T-3 Multiplexers/Services
☐ 85. ☐ DSL Services/Products
☐ 86. ☐ SONET
☐ 87. ☐ Inverse Multiplexers
☐ 88. ☐ SMDS
☐ 89. ☐ Diagnostic/Test Equipment
☐ 90. ☐ DSU/CSU
☐ 91. ☐ VSAT/Satellite
☐ 92. ☐ PBXs
☐ 93. ☐ Voice Mail/Response
☐ 94. ☐ Videoconferencing
☐ 95. ☐ Leased Lines
☐ 96. ☐ Switched Data
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 00. ☐ None of the above (1 - 99)

9 Please indicate the platforms that are currently installed/planned:

(Check ALL that apply) A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS
A B
☐ 01. ☐ TCP/IP
☐ 02. ☐ IPv6
☐ 03. ☐ SNA
☐ 04. ☐ DECnet
☐ 05. ☐ Novell IPX/SPX
☐ 06. ☐ APPC/APPN/LU 6.2
☐ 07. ☐ NETBIOS
☐ 08. ☐ AppleTalk
☐ 09. ☐ NFS
☐ 10. ☐ Other *(please specify)* ______________________

LAN ENVIRONMENT
A B
☐ 11. ☐ Gigabit Ethernet
☐ 12. ☐ Switched Ethernet
☐ 13. ☐ Fast Ethernet (100 Megabit Ethernet)
☐ 14. ☐ Ethernet
☐ 15. ☐ ATM
☐ 16. ☐ Token Ring/Token Ring Switching
☐ 17. ☐ IP Switching
☐ 18. ☐ FDDI
☐ 19. ☐ 100Base-T
☐ 20. ☐ 10Base-T
☐ 21. ☐ LocalTalk
☐ 22. ☐ Fibre Channel
☐ 23. ☐ 100vg Any LAN
☐ 24. ☐ Other *(please specify)* ______________________

NETWORK OPERATING SYSTEM
A B
☐ 25. ☐ Windows NT
☐ 26. ☐ Windows NT/Advanced Server
☐ 27. ☐ Novell IntranetWare
☐ 28. ☐ Novell (NetWare 4.X)
☐ 29. ☐ Novell (NetWare 2.X, 3.X)
☐ 30. ☐ Microsoft (LAN Manager)
☐ 31. ☐ LocalTalk (AppleTalk)
☐ 32. ☐ Banyan (VINES)
☐ 33. ☐ IBM (LAN Server)
☐ 34. ☐ Artisoft (LANtastic)
☐ 35. ☐ Other *(please specify)* ______________________

COMPUTER OPERATING SYSTEM
A B
☐ 36. ☐ NT Server
☐ 37. ☐ NT Workstation
☐ 38. ☐ Unix/Xenix/AIX
☐ 39. ☐ Solaris
☐ 40. ☐ Windows
☐ 41. ☐ Windows 95
☐ 42. ☐ Windows 97
☐ 43. ☐ DOS
☐ 44. ☐ OS/2/OS/2 Warp
☐ 45. ☐ IBM MVS/VM/VSE
☐ 46. ☐ Digital VMS
☐ 47. ☐ Macintosh
☐ 48. ☐ Other *(please specify)* ______________________

☐ 49. ☐ None of the above (1-48)

10 Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

	A. Servers		B. Clients		A. Servers		B. Clients
Power PC	☐	01.	☐	486	☐	07.	☐
Power Mac	☐	02.	☐	386	☐	08.	☐
Mac Other	☐	03.	☐	286	☐	09.	☐
Multiprocessor Servers	☐	04.	☐	Risc	☐	10.	☐
PG/PII	☐	05.	☐	Alpha	☐	11.	☐
Pentium/Pentium Pro	☐	06.	☐	Other	☐	12.	☐

11 Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale) Installed/Planned
1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other ______________________

B - Minis (Midrange) Installed/Planned
1. ☐ IBM RS6000
2. ☐ IBM AS400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other ______________________

C - Workstations Installed/Planned
1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other ______________________

12 What is the estimated gross annual revenue of your entire company/institution? (check one only)

01. ☐ $20 billion or more
02. ☐ $10 billion to $19.9 billion
03. ☐ $1 billion to $9.9 billion
04. ☐ $500 million to $999.9 million
05. ☐ $100 million to $499.9 million
06. ☐ $50 million to $99.9 million
07. ☐ $10 million to $49.9 million
08. ☐ $5 million to $9.9 million
09. ☐ $4.9 million or less
10. ☐ None of the above

13 For which areas outside of North America do you have purchase influence? (check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

Please indicate the names and job functions of other individuals at your location to whom you would like us to send a copy of NetworkWorld.

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Name ______________________ Job Function ______________________

Name ______________________ Job Function ______________________

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Briefs

■ **SpaceWorks, Inc.** *this week announced Order Manager 3.0, the latest version of the company's business-to-business* **extranet software.** *Set to ship by March, the new version includes work-flow-based order approval, as well as a cross-selling mechanism for linking related products. Order Manager 3.0, which runs on HP-UX, Solaris and Windows NT, is priced from $100,000 to $200,000.*

✆ SpaceWorks: (301) 251-4136

■ **Sun Microsystems, Inc.** *and a coalition of retailers and technology firms last week announced a standard for Java-based* **point-of-sale** *(JavaPOS) applications. Applications developed using the JavaPOS standard will be able to run on cash registers, telephones, smart card readers and computer terminals, Sun officials said.*

Joining Sun in proposing the JavaPOS standard are national retailers such as Sears Roebuck & Co., J.C. Penney Co. and The Home Depot, as well as IBM, NCR Corp. and others. Sun's new standard for retail Java applications will compete with Microsoft Corp.'s OLE Point of Sale, which has been adopted by a number of retailers. The JavaPOS standard can be found at www.javapos.com.

■ **Data management** *software start-up* **Magnifi, Inc.,** *of Cupertino, Calif., next Monday will announce a new version of its enterprise server software for corporate intranets and Web sites. Magnifi Enterprise Server 2.0 analyzes, indexes and retrieves digital data such as spreadsheets, word processing documents, images, animation, audio and video, company officials said. Pricing and availability of Enterprise Server 2.0 was unavailable. Version 1.0 released last May costs $15,000.*

✆ Magnifi: (408) 863-3870

RSA blasts (but also supports) government encryption policy

Security gurus debate key recovery at RSA conference.

By Ellen Messmer
San Francisco

It was a theatrical way to kick off the RSA Data Security Conference here two weeks ago. Dressed in rap "gangsta" attire and shades, and accompanied by real rap artists — The Sugarhill Gang — a disguised Jim Bidzos, RSA Data Security, Inc.'s (RSA) president, danced onstage to rap lyrics condemning the U.S. government's encryption policies.

"Do encryption without going to jail," sang Bidzos, alluding to government rules that generally make it illegal to export products with strong encryption unless you agree to give law enforcement a way to easily unscramble data.

Get more online:

- **A BSAFE overview**
- **A similar look at the Common Data Security Architecture**

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The 3,000 or so security professionals in attendance loved Bidzos' act. But few seemed to realize that although the company continues to lobby hard in Washington, D.C. against the kind of government-mandated key-recovery laws FBI Director Louis Freeh wants, in reality, RSA really is singing a different tune.

The next version of the RSA encryption tool kit, BSAFE 4.0, will force those building products with anything over 56-bit strength encryption to use a key-recovery center for exportable products. The centers are approved by the U.S. government to store the equivalent of master keys.

Corporations buying products made with BSAFE 4.0, which is due out midyear, may be allowed to operate their own key-recovery centers for key storage, if the government approves.

"As far as cryptoservice providers go, the signature is mandatory. It enforces a law-enforcement policy," said Kevin Kingdon, RSA technical director.

"Adding the KeyWorks extensions to the BSAFE tool kit lets developers offer this key-recovery option."
Jim Bidzos, president, RSA Data Security

BSAFE 4.0 will be based on an Open Group standard devised by Intel Corp. called the Common Data Security Architecture (CDSA) 2.0, with key-recovery extensions from IBM called KeyWorks.

KeyWorks is based on RecoverKey technology from Trusted Information Systems, Inc. (TIS).

RSA agreed to adopt CDSA and KeyWorks as part of a broad-based security alliance with Security Dynamics, Inc., RSA's owner. Under the alliance, IBM will resell the Security Dynamics ACE/Server authentication products.

Ironically, RSA is now also betting on the Digital Signature Standard and the Secure Hash Algorithm, technologies it fought over with the government four years ago before they became government standards.

One RSA licensee, TimeStep Corp., said it does not like where RSA is going with BSAFE. "Our customers don't want key-recovery," said Tony Rosati, TimeStep vice president of marketing.

Phil Zimmermann, founder of Pretty Good Privacy, Inc. (PGP) and now a "fellow" at Network Associates (which acquired PGP), hopes PGP software will "never" be based on government key-recovery software. PGP also is an RSA licensee.

However, TIS said corporations are adopting government-approved key-recovery. Dutch Shell Oil is allowed to operate its own key-recovery center in Holland, said TIS lawyer Ken Mendelson, also noting that TIS is acting as a government-certified key-recovery center for Sears, Inc.

At the RSA conference, one after another of the cryptoexperts said government key-recovery is unworkable on a large scale. It also will increase costs for the end user, who will end up paying for the new software complexity and key-recovery center costs.

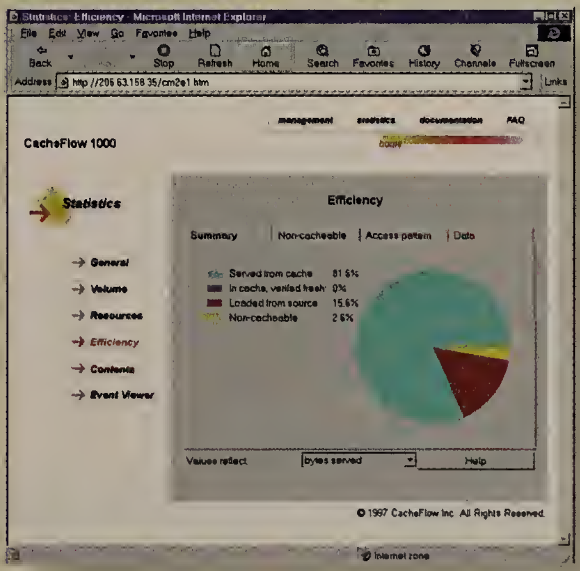
Matt Blaze, principal research scientist at AT&T Laboratories, told the RSA audience that research completed by a group of cryptographers, including Whitfield Diffie of Sun Microsystems, Inc., found that "large-scale key-recovery on the scale envisioned by the government in the key-management infrastructure proposals lies beyond the current competency in the field."

TIS President Steve Walker disputed the findings, saying the cryptographers' panel "had looked only at the worst possible scenarios." Office of Management and Budget official Bruce McConnell told conference attendees that the government has tested 13 applications using a variety of key-recovery methods from Entrust Technologies, Inc., TIS, IBM's Secret Agent and VeriSign, Inc.

"We showed, yes, you can make key-recovery work," said McConnell, adding that the report's findings will be published in March. ■

QUICK TAKE: CACHEFLOW 1000

Hardware/software combination speeds posting to desktop



Address: http //205 63.158 35/cm2e1 htm

Served from cache 81.5%
In cache, verified fresh 0%
Loaded from source 15.6%
Non-cacheable 2.6%

Values reflect: bytes served

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CacheFlow, a Palo Alto, Calif., company started in March 1996, has released its first product, the CacheFlow 1000, which combines rack-mounted hardware and custom software.

Unlike most caching products, the CacheFlow 1000 uses what the company calls "active caching" to "prefetch" requested data from servers in order to faster build the Web page on-screen. The product also uses probability analysis or "predictive refresh" to determine what pages may be updated in the cache before they actually are requested by a user. Password-protected software also is included that enables the administrator to monitor and maintain the cache's operation via any Java-equipped browser.

The price for the CacheFlow 1000 ranges from $39,500 for an 8G-byte cache to $47,700 for a 25G-byte cache. Additional 4G-byte drives can be added, up to the maximum of 25G bytes, if more cache capacity is required.

✆ CacheFlow: (650) 849-1400

'NET INSIDER

An image of an ivory tower

The Internet facilitates a disconnection between image and reality.

An example of this can be seen in an article about the proliferation of Internet-based diploma mills in the Dec. 19, 1997 edition of the *Chronicle of Higher Education.*

It turns out that there is a growing number of Internet-based sites offering rapid turnaround on advanced degrees via distance learning, based on "life and work experience" rather than traditional classroom work and research. While this is not a new problem — the FBI shut down 39 self-described colleges between 1983 and 1986 — the Internet is making it easier for these types of businesses to operate.

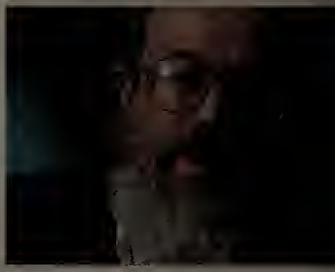
Part of the problem is that it is so easy to obtain misleading domain names. There is no mechanism in place to check on whether a name relates to any legitimate activity of the person or organization that is requesting the domain name.

I may be mistaken in the specific case, but the person in Reykjavik, Iceland who owns the domain name Carnegie-Mellon.com seems well positioned to offer services in a way that just might be confused with services offered by a well-known U.S. university. Hundreds of examples exist of domain names that seem purposely designed to be misleading.

Another part of the problem is that the Internet is too international. Two problems stem from this: First, there is no way for the typical user to know whether the actual location of an Internet site is in, say, Pittsburgh or Reykjavik.

Second, these sites are not under any single legal jurisdiction. The FBI, for instance, probably has little clout in Reykjavik.

But perhaps the biggest problem is that true distance learning programs are being developed and many of them will be delivered over the Internet. While distance learning is a good thing, the fact that so many more organizations will be entering the field will make it harder to identify the charlatans.



Scott Bradner

Some are easy to spot: One offered a degree in business administration for $2,000 along with a summary of a $25 textbook. But even if the lack of real work is clear to those obtaining degrees through this type of process, it can be quite hard for the employment office at your company to keep track of which organizations offer meaningful educational experiences and should be taken seriously when evaluating candidates.

Such issues could cast a shadow over the entire distance learning business and hurt the legitimate as well as the illegitimate institutions and their students.

The distance learning market points out yet another example of how tricky it is to establish credentials over the Internet. Understanding how genuine medical or investment advice, merchandise offers and educational opportunities are when they come packaged in well-written e-mail or a polished Web site is already a hard thing to do. It is going to get more difficult as those who would separate a fool from his money get better at Web design.

Disclaimer: Harvard is exploring the distance learning biz and has had problems with copycat domain names, but the above are my own opinions.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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Circle Reader Service **#30**

Commerce choices

E-commerce storefronts abound

By Ellen Messmer

When it comes to choosing an electronic storefront, budding Web merchants are finding a dazzling number of selections, with a stunning range of prices.

Basic electronic commerce (EC) storefront software could cost as little as $1,000, or up to one hundred grand. On the service side, there are companies that can grant you a cyberspace lease, with ways to update retail-product information and get purchase orders.

So how does your organization decide what to do? When Skokie, Ill.-based Rand McNally & Co. last year decided it wanted to try selling its maps and guidebooks over the World Wide Web, the company set up an internal team to evaluate electronic commerce storefronts.

"We found that many vendors have software with back-end integration with legacy systems that is very expensive," says Victoria Donnowitz, Rand McNally's vice president of retail in Skokie. There also was a wide range of software from about $5,000 to $15,000 that gave the user a shopping cart, customer order management and a search engine.

Rand McNally ended up picking ComForce, a middle-tier storefront from Snickleways Interactive, Inc., not only because it liked its design, but because the New York-based Snickleways support staffers "were very creative" in helping Rand McNally make its product information Web-presentable, Donnowitz says.

By working together over the 'Net from distant cities, Rand McNally and Snickleways together reviewed the design work in Snickleways' online conference room.

It took about eight weeks to get the randmcnallystore.com up and running. It launched last November and sells about 3,400 different products. The Rand McNally network staff manages the Snickleways EC storefront, which runs on Microsoft Corp.'s SiteServer 2.0 and Commerce Server 2.0.

Sales at the site are good enough — with about 10% from outside the U.S. — that Rand McNally is planning on further upgrades that involve more back-end integration. The company still manually processes credit card numbers it gets over the 'Net, but wants to automate its credit card authorization.

Snickleways ComForce software starts at $10,000, but some companies, such as Fruit of the Loom, Inc., use the $150,000 Platinum version.

There are some good reasons to spend $45,000 or more on the more pricey storefront software from vendors such as BroadVision, Inc., Connect, Inc., Open Market, Inc. and Pandesic LLC. "The lower end products just aren't scalable," says Andy Schwab, executive vice president at the Internet professional services division of Cary, N.C.-based systems integrator TriNet Services Corp.

However, IBM's net.commerce product, which starts at only $5,000, should be grouped with the tonier high-end storefronts because it scales enormously well and supports back-end connections to databases and payment processors, Schwab claims.

Schwab says he has found net.commerce software to be very flexible; he's been able to integrate almost all other vendors' software modules into it, including third-party advertising engines.

WHAT'S FOR SALE IN ELECTRONIC COMMERCE STOREFRONTS

Vendor	Product	Starting price
BroadVision	BroadVision One-to-One	$60,000
Connect	OrderStream	$100,000
EveryWare	Tango Merchant	$1,995
IBM	net.commerce	$5,000
iCat	Electronic Commerce Suite	$3,495
INEX	Commerce Court	$595
Internet Factory	Merchant Builder	$1,495
Intershop Communications	Intershop Mall	$5,995
Mercantec	SoftCart Store Builder	$1,500
Open Market	LiveCommerce	$45,000
Pandesic	Pandesic E-Business Solution 1.1	$25,000 plus transaction fees
Snickelways Interactive	ComForce	$10,000 plus transaction fees
The Vision Factory	Cat@log Direct-to-Web	$10,000

But the downside to net.commerce is the need to write more custom code than with competing products such as Open Market's LiveCommerce. "LiveCommerce arrives with more prewritten Web-based administration interfaces," Schwab says. The downside to LiveCommerce, however, is it can be impossible to integrate third-party software, Schwab says.

A common concern for Web merchants seems to be setting up links to automated credit card processing because third-party card processors still are rather new to the Web. CyberCash, Inc. "does a better job of connecting [card] processors on the back end, but they require users to have their CyberWallet [software]," Schwab says. Open Market's Transact server also can send information down a private line to a processor.

Some Web sites are already credit card ready. First Union Bank's site has a private connection to card processor FDC Corp. to handle Secure Sockets Layer (SSL)-based card transactions.

There are a number of early success stories. New York-based Eastern Meat Farms, Inc. invested about $20,000 in the Mercantec Corp. Mercantec SoftCart shopping cart software and design help from BeOntheNet, Inc., and now sells Italian delectables at salami.com. The site is not highly automated, but it does let the family-owned business take orders online just by checking e-mail, says Vinnie Barbieri of the salami.com Web service. "This is the modern alternative to a mail-order catalog, I guess," he says.

Leased in cyberspace

A popular alternative to maintaining a Web storefront is to lease space from cyberspace malls. For instance, San Diego-based Internet Web Services Corp. manages multiple Web servers on the powerful IBM RS/6000 server platform. It uses net.commerce software to host about 125 storefronts at oneworldcenter.com.

The cost for the service? "There's a $12,500 entry level fee, and we design it, build it, host it, handle the transaction processing and advertise it," says Robert Noakes, Internet Web Services Corp. vice president. "We can integrate with your back-end systems and your workflow environment for [electronic data interchange], if needed."

EC the Microsoft way

Only a few months after Microsoft shipped its $20,000 Merchant Server last year, the company quietly retired it after it failed to sell very well. In its place arrived the $4,999 SiteServer Enterprise Edition, which has a storebuilder wizard that Microsoft lead product manager Jonathan Weinstein says can set up "starter stores."

But SiteServer lacks order management and billing systems, though it has APIs that support more complex business functions. Several vendors of storefront software, including Mercantec Corp., are writing to these SiteServer APIs.

Microsoft's next step will likely be its release of SiteServer 3.0 by midyear; it is expected to have a set of APIs called the Commerce Interchange Pipeline, based on XML for application-to-application exchange over the Internet to back-end EDI systems.

IBM appears to be moving along the same lines. Along with 70 other vendors calling themselves the Open Trading Protocol Consortium, IBM two weeks ago released the draft of an XML-based specification called the Open Trading Protocol. The protocol is expected to form the basis for building retail storefronts for business-to-consumer Web-based commerce. ■

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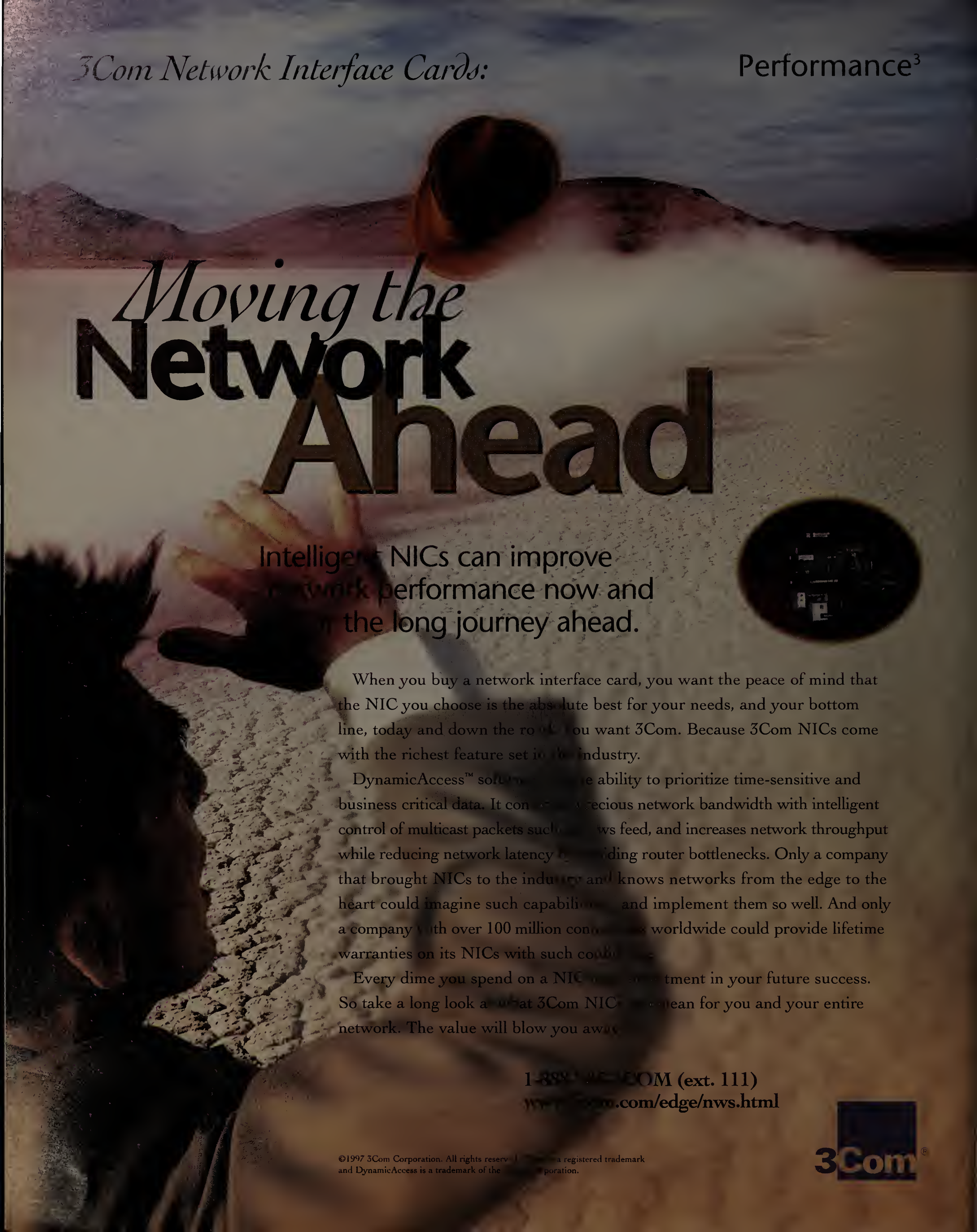

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Due to some unique requirements at our site, we have to direct the printing function that our FAXserve utility [from Computer Associates International, Inc.] would normally handle at the server to a workstation and then let Windows 95 handle the printing task.

We have been having a problem in recent weeks in that the workstation running the Bitware Client for FAXserve will hang and say it is printing faxes when nothing actually appears on the printer. When the workstation is rebooted, the problem disappears, but just for several days. We are using FAXserve 5.0 and NetWare 3.12. Do you have any suggestions?

Via the Internet

There are several possible problems. First, download the latest service pack for FAXserve from www.cheyenne.com. This will update the NetWare Loadable Modules (NLM) FAXserve uses and provide updates to the Bitware Client for FAXserve. After applying the FAXserve service pack, apply the Bitware Client update and reboot the workstation.

If the problem persists, upgrade the workstation to the latest version of Novell, Inc.'s IntranetWare Client for Windows 95. This resolved a similar problem I encountered recently.

In addition, you should review http://support.novell.com and apply the files listed under the minimum updates list for your copy of NetWare. The randomness of your problem could be due in part to some NLMs needing to be updated on the server.

Also check on applicable updates for the workstation you're using for printing and, if it isn't already, consider plugging that workstation into a surge protector or uninterruptible power supply.

If you are using the original version of Windows 95, you also should download and apply Windows 95 Service Pack 1. As long as the version of Windows 95 is prior to OSR2 (also known as Rev B), download and apply the KRNLUPD.EXE update.

Performance management

Taking measure of enterprise net performance

By Fred Engel

From an IT perspective, improving the efficiency of a business process means improving response time.

Not surprisingly, response time is the Holy Grail of network measurements. But like many Holy Grails, improving and even accurately measuring response time in the first place are ambitious objectives.

There are three components of response time — any of which can cause delay:

- Type and age of end users' computers
- Network speed and available bandwidth
- The servers that fulfill user requests

You can further divide response measurement into two camps: latency and end-user response time, two concepts that are frequently confused.

Latency measures the time it takes for a packet to travel from Point A to Point B and back — often called a PING after a program that measures this time. End-user response time measures the end user's performance, or time to complete a specific task.

Latency defined

Latency measures the consistency of the network. Each path has a unique latency number that changes throughout the day. A user in one part of the building may experience delays that another user may not see.

Most increases in latency, or delay, occur for two basic reasons. They may occur because network elements, such as routers, switches and wires, are overloaded or badly configured. A router with insufficient memory or a wire that doesn't have enough bandwidth will cause latency to increase as traffic begins to build.

Second, latency increases because packets are making more hops than normal, increasing travel time. Large hop counts occur because of poor configuration in your network or in your carrier's network.

If, for example, one of your carrier's switches is experiencing a problem and its technicians reroute your traffic, latency will increase because the packets are traveling farther to get to the end of the wire. The same problems could occur inside your enterprise network if the routers are not configured properly.

UP CLOSE

Measuring network performance

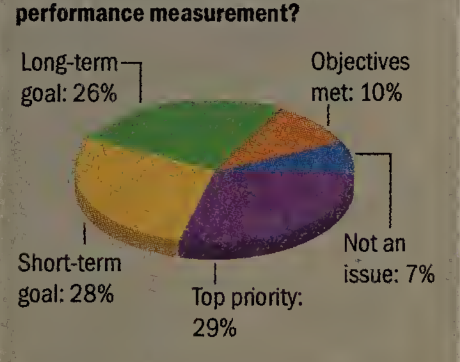
Getting a handle on how networked devices and applications are performing is a central task for network managers. Tools that automate response-time measurement and troubleshooting routines save money and IS resources. They usually fall into three categories:

Application Protocol Response: A specific probe that looks at the applications protocol, such as SQL, and measures transaction time.

TCP Acknowledge (ACK) Response: A technique implemented in probes that measures the time it takes a machine to acknowledge TCP packets for a particular datastream.

Embedded Applications: Software packages that sit on the end-user system and "spy" on the work performed by the end user, measuring the various interactions the user has with the network.

How urgent is the need for network device performance measurement?



Based on a poll of 500 IS managers by International Data Corp.

Most of these changes can be addressed and corrected, but it is important to recognize that bandwidth and latency are two separate measures of the performance of your network.

Response times

End-user response time measures the total elapsed time it takes for the user to see action or for a particular task to be completed. Conceptually, it is the time between hitting the "enter" button and getting the answer. While measuring what the user sees is most straightforward, it can be subjective.

The most direct way to measure end-user response time is within the user's application and in the end-user system itself.

Unfortunately, application vendors today have not incorporated these types of metrics or standardized on ways of collecting these numbers — the key to providing accurate response time measures to users.

Thus, IT managers are faced with products that provide indirect measures of response time. They measure protocol latency inside the server in the hopes that changes in speed will be reflected in the same way users experience enhanced and degraded performance.

Although these products are a good first step, whether they adequately measure response time in a meaningful fashion is still unclear.

For example, Application Protocol Response probes look at the application protocol to measure application transaction times. As with any probe-based solution, certain transactions cannot be measured accurately. However, given the nature of this measurement, it is likely to be a close sample of what the user sees for high-level transactions.

Other tools, such as TCP Acknowledge (ACK) Response probes, which measure TCP response times, are limited to certain types of applications and to the protocols implemented by the probe. Probe placement is also critical to the success of this methodology, but the jury is still out on whether measuring ACK response correlates well with what the user sees.

Finally, embedded applications that sit on the end-user system and "spy" on the work performed by the end user are promising because they measure what the end user actually sees. The downside is that the software needs to be installed on every end-user system and could be cumbersome to manage.

Test drive

The accuracy of tools used to measure response time is easy to determine. Test the tool on the actual application you are trying to measure and publish the numbers to end users for a month. If end users agree that response time goes up when there is not much traffic and goes down when traffic increases, then the tool is accurately measuring what users see.

While obtaining exact times on a per-transaction basis is ideal, knowing the type of service each user sees and how it changes over time is a huge step forward. Because today's response time tools are new, their ability to provide good service is still not well understood.

It is too early to tell if they are effective measuring devices for the complex application scenarios deployed today. Ultimately, their success or failure will depend on their ability to reflect in objective metrics what users know and feel subjectively.

Engel is the vice president of engineering at Concord Communications, Inc., a Web-based reporting and analysis company. Engel is involved in several IETF standards activities, including the RMON I and RMON II committee. He can be reached at (508) 460-4646.

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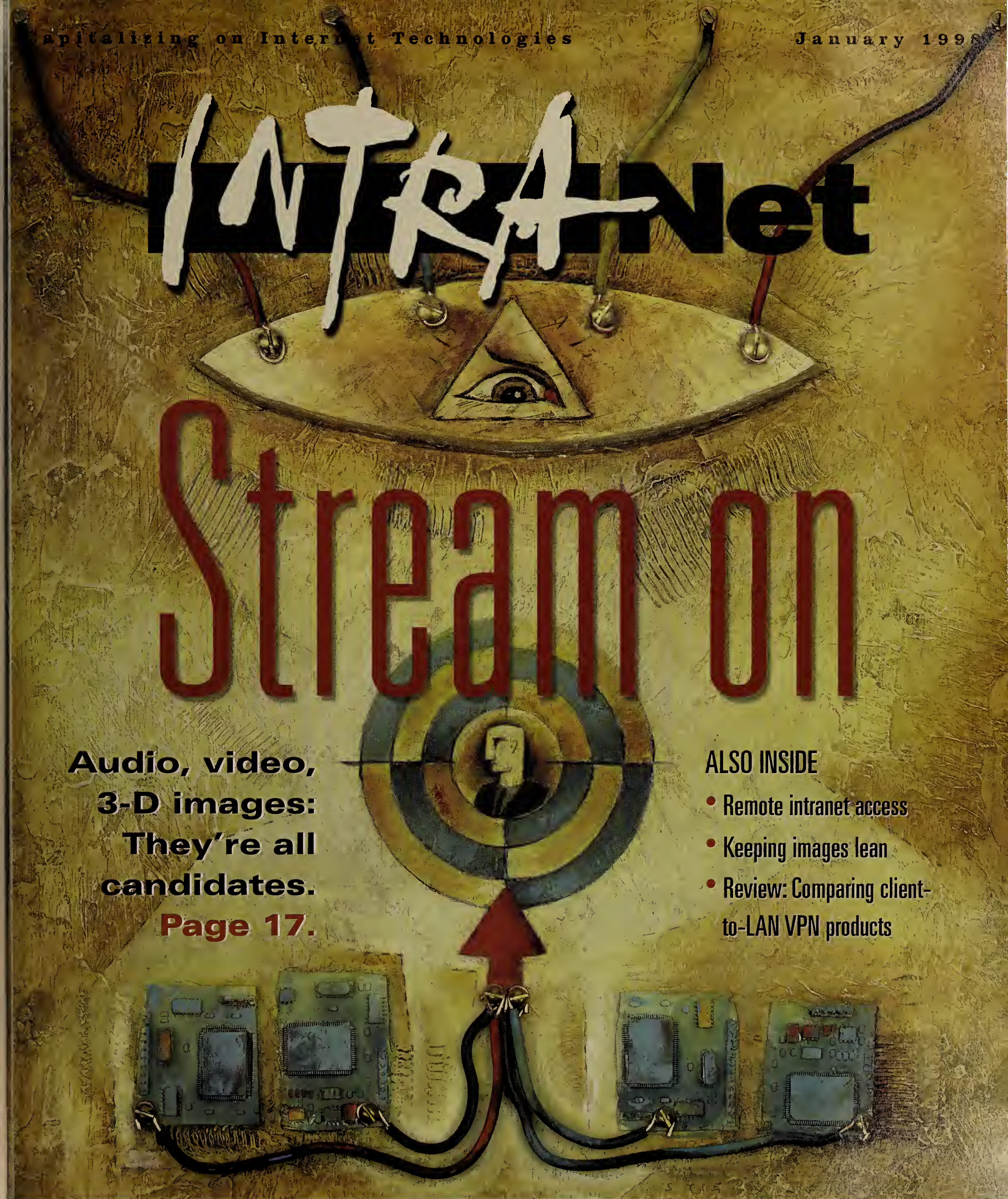

Stream on

Audio, video, 3-D images: They're all candidates. Page 17.

ALSO INSIDE

- Remote intranet access
- Keeping images lean
- Review: Comparing client-to-LAN VPN products

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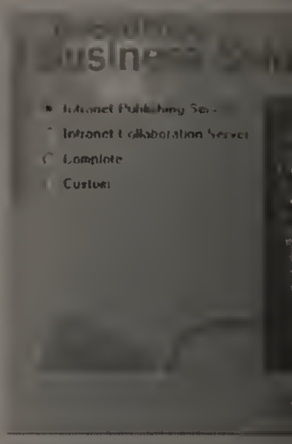

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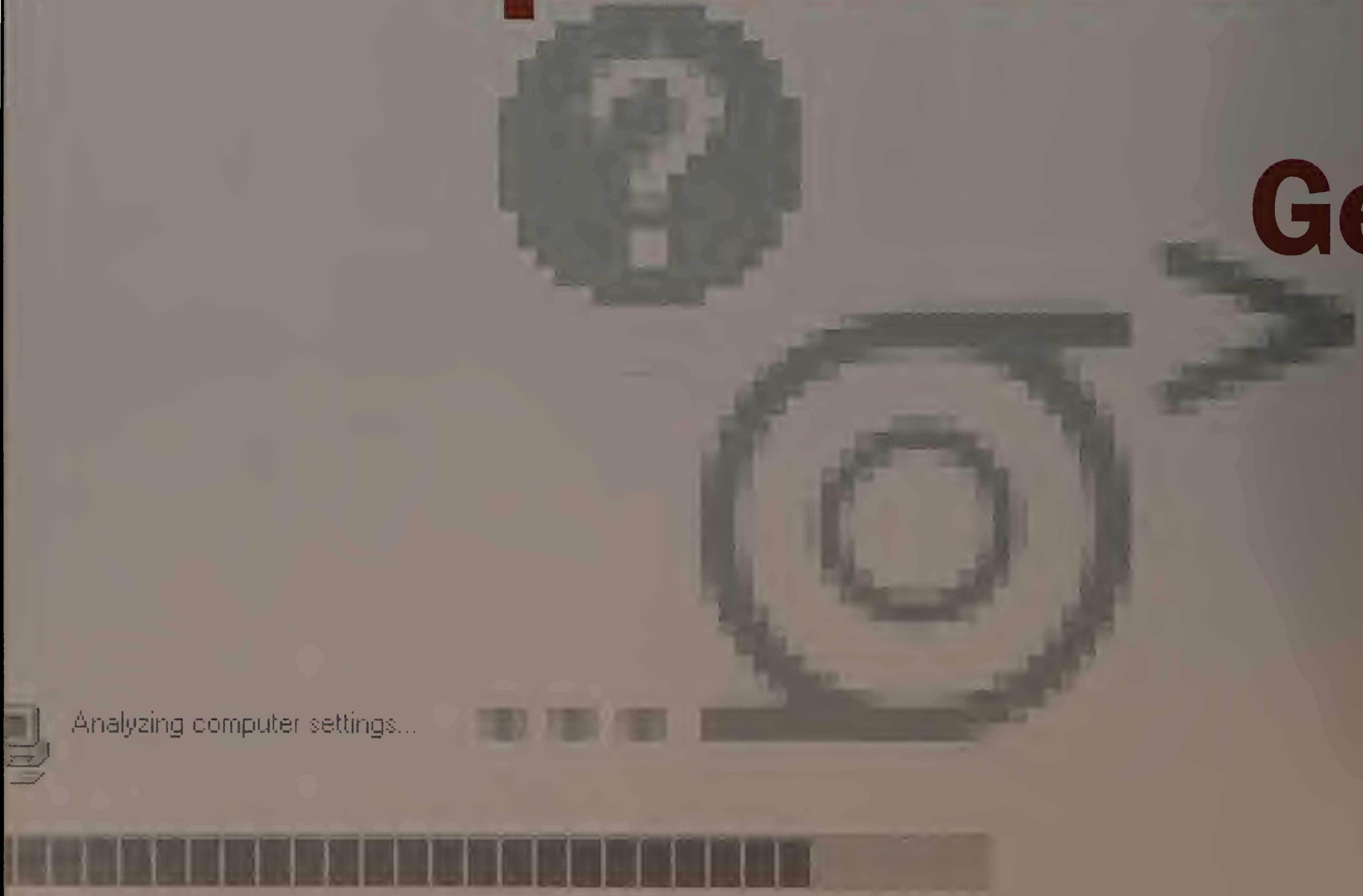

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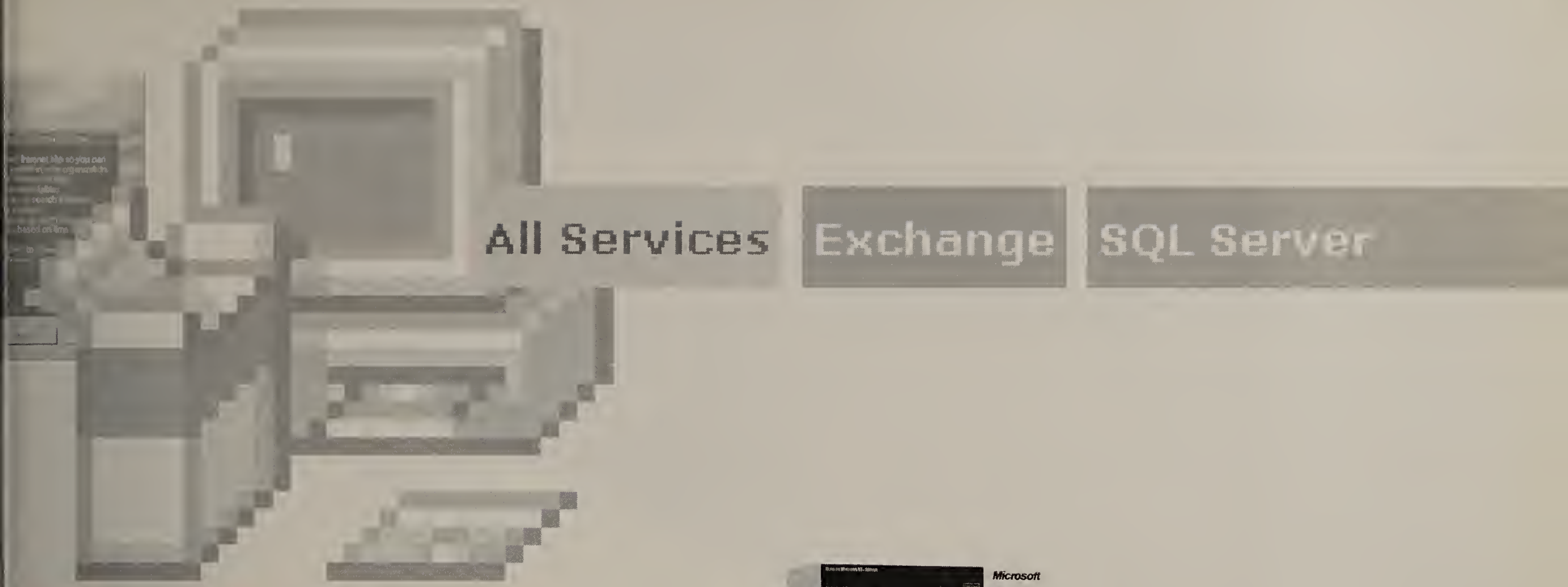

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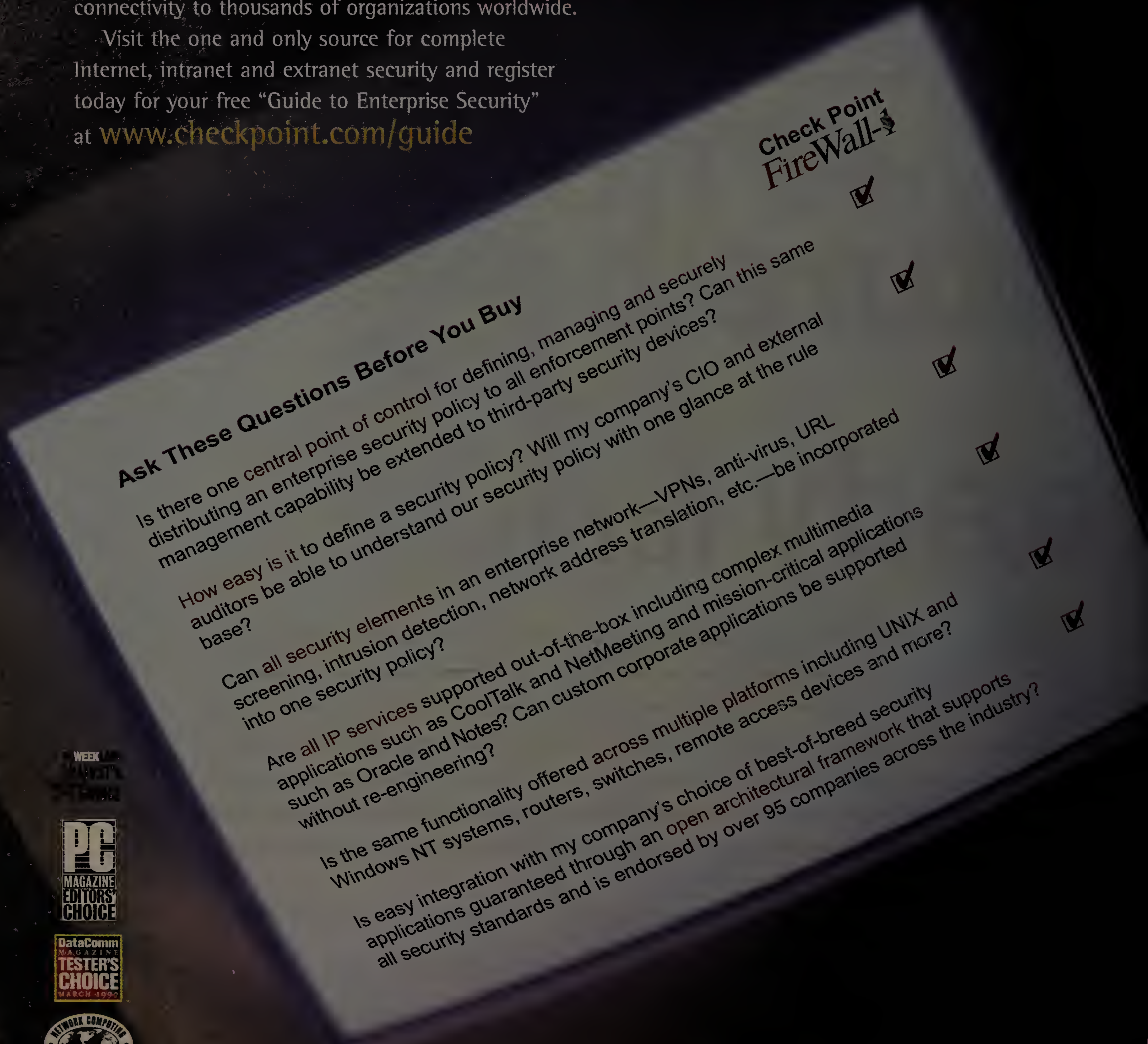

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IntraNet

January 1998
Volume 3, Number 1

FEATURES ●

COVER ILLUSTRATION BY STEIN LOKEN

17 **COVER: Stream on**
Intranet managers are finding business purposes for streaming media technology, whether for delivering broadcasts of executive speeches or for beefing up online training programs. One industrial company says the technology will revolutionize the use of CAD systems.

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Intranet intensity
Without a doubt, IBMers have embraced Web technology — the hundreds of thousands of browser-wielding employees hit the intranet for information some four million times per day. Following recent changes, its server architecture is up to the challenge.

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Tapping roots
Web technology offers remote and nomadic users easy access to information sprouting up on the home office intranet. But is surfing across the Internet and into the intranet as safe and easy as traditional remote access?

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Lean and mean
Unless you're into bogging down users with unnecessarily large downloads, optimizing Web content should be one of your priorities as an intranet manager. Trimming a few thousand bytes from image files can make all the difference for users digging for information.

25
Show me the value!
Harvard Business School Professor Lynda Applegate loves forcing business professionals to quantify what value they're getting from their IS investments. In this Q&A, we probe her on what value companies should be able to derive from their intranets.

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Product Watch: Streaming tools 8
The latest streaming audio and video products boost delivery and provide better fidelity.

Ask Dr. IntraNet 10
This month the doctor works through a problem with Domain Name System reverse lookups and advises on the use of the Point-to-Point Tunneling Protocol.

Handbook: Browser configuration 10
Microsoft and Netscape kits ease the burden of deploying or upgrading hundreds or thousands of Web browsers.

Review: Client-to-LAN VPNs 11
In this comparative review, we examine how a variety of client-to-LAN virtual private network products stack up against each other.

IntraVert: Lights, camera, action! 27
Columnist Mark Gibbs thinks intranet managers the world over should be playing with streaming media.

IntraNet is a supplement to *Network World* published by International Data Group of Boston. *Network World*, 161 Worcester Road, Framingham, MA 01701. Phone: (508) 875-6400, Fax: (508) 820-3467, E-mail: nwnews@nww.com.

From the Editor

At a recent intranet conference for corporate communicators, some advice emerged during presentations on organizing information, delivering Web-based training and making intranets interactive. The tip: Work with IT.

But many attendees protested that their IT managers didn't want to be bothered with an intranet. "Nevertheless, you've got to recognize that you can't do this without your IS department," stressed Charlene Wheeless, director of corporate communications at billion-dollar information technology firm DynCorp., during a presentation on how to restart a stalled intranet effort.

The message delivered by those who have been involved with successful intranets is that it's not a good idea to make IT the enemy. Wheeless advised that knowing Web lingo, being aware of network considerations and understanding potential applications goes a long way toward melting the IT ice.

Hooray for Wheeless. She not only recognizes the critical nature of Web technology for boosting internal communications, but also understands that an intranet built for one department is not an island. Good, strong intranets are destined to take on mission-critical applications such as electronic commerce and collaborative product development, and savvy team players like Wheeless know it.

You rightly have reservations when technology know-nothings jump on a bandwagon that, once it gets rolling, could significantly impact computing and networking infrastructures — not to mention the bottom line. But if someone who clearly has done some homework on intranets comes banging on your door, don't dismiss them.

When it comes to internal Webs, the only enemy is someone unwilling to listen.

— *Beth Schultz*, executive editor
(bschultz@nww.com)

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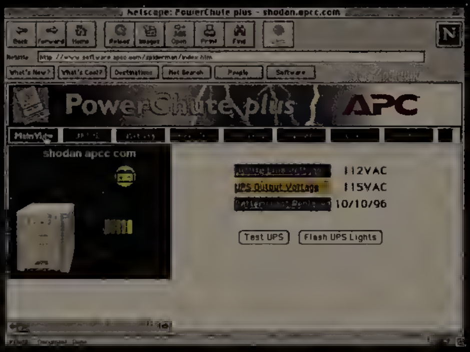

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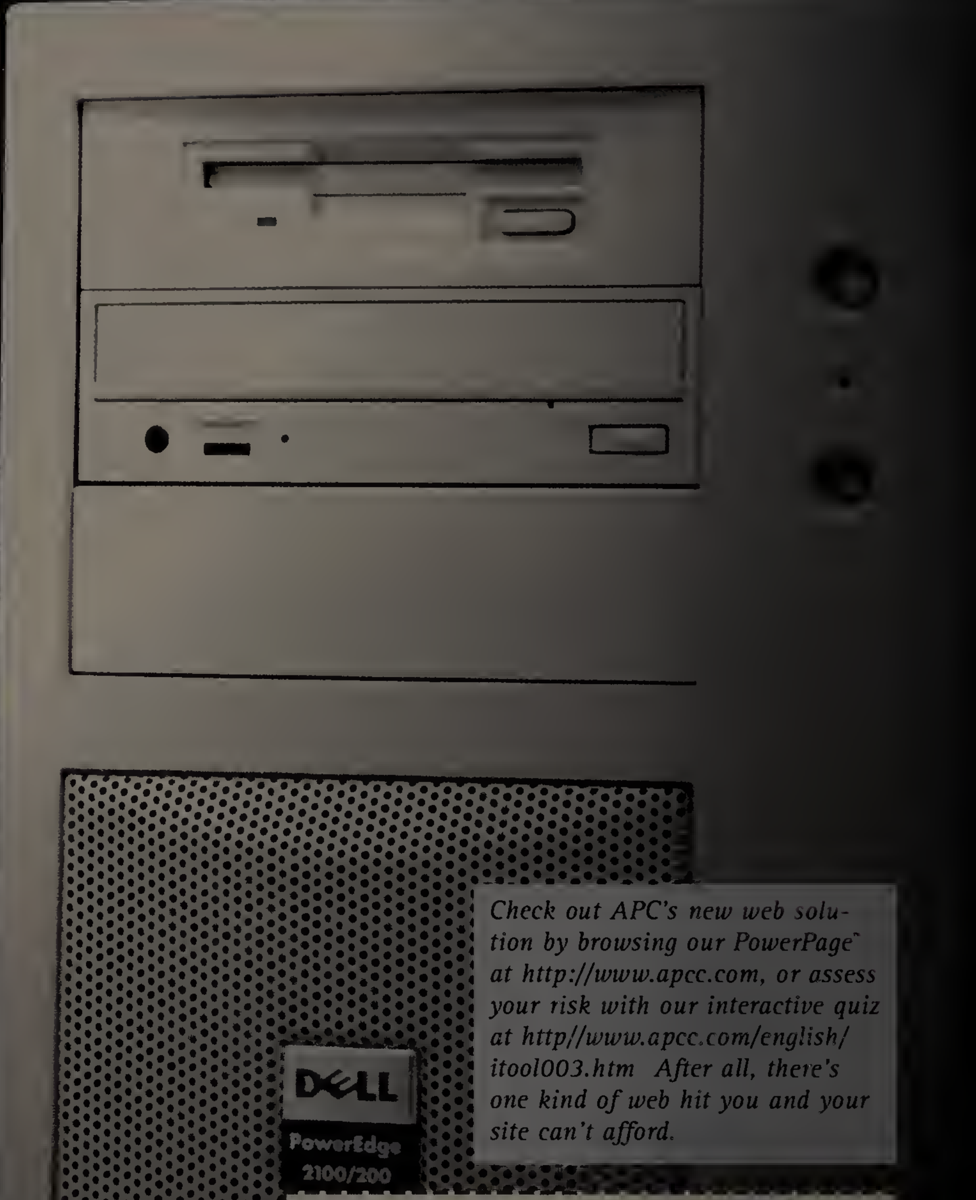

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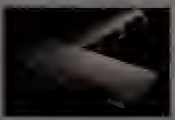

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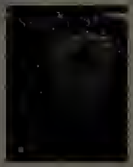

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Stocking the intranet with digital images

If your company is concerned about its public image (and what company isn't?), then setting up an intranet-based digital media library might be a smart move.

Placing officially sanctioned logos on the intranet for easy download can bring consistency in the company's appearance from one presentation to the next. The same can be said for photographs of key personnel, building and product shots and slides detailing revenue growth, operating territories, lines of business and other basic facts.

"Our intranet-based digital image library saves us time and money and provides consistency, quality and accuracy," says Pat Long, communications technology manager at Dana Corp., of Toledo, Ohio.

Long, who spoke recently at an intranet conference hosted by Ragan Communications, Inc., in Chicago, helped stock Dana's digital media library with thousands of images. The images reside on two Unix servers — one is on Dana's intranet and the other, for third parties, is at an outsourcing firm.

People are definitely visiting the library. The hit count averages about 47,000 for a two-month period, Long says.

The number of downloads is far lower, however. During October and November 1997, it was 593, Long says.

A CLEAN IMAGE

Dana offers varying image resolutions so downloads don't bog down the Intranet. They are:

- 5K-byte JPG thumbnails
- 25K-byte JPG previews
- 300K-byte TIF files for low-resolution downloads
- Larger TIF files for high-resolution downloads

Larger files, of say 20M bytes, are stored offline on CDs.

Starting from scratch

Maloff: You've got to sell the intranet.

Intranets can strategically change the way your business functions, but not without some upfront effort.

Joel Maloff, president of The Maloff Co., of Dexter, Mich., offered these guidelines for selling the intranet concept. He spoke at the Internet World conference held late last year in New York.

- Examine current practices and their costs.

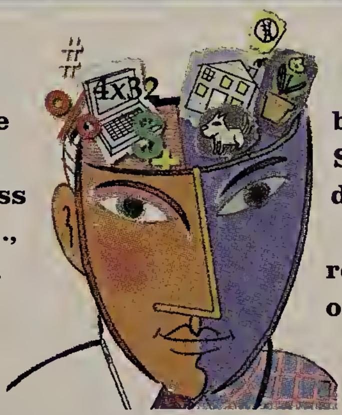
Web-based document management can speed routine scanning or re-keying of documents.

- Don't assume people will implement programs in their spare time.

"How can we say it's critical to our fundamental business if we don't staff it and fund it?"

- Coordinate efforts among departments. (One client had contracts with five different Web site hosting companies.)
- Make a plan for return on investment.
- Ask vendors to address the business issues you wish to handle with your intranet.
- Be flexible; expect changes.

Browsing for backup



Two storage vendors are capitalizing on the World Wide Web to make data loss less painful. Atrieva Corp., in Seattle, and Connected Corp., in Framingham, Mass., offer Web-based data backup and recovery services.

With each vendor's service, a client agent logs on to the storage company's Web site and uploads user-designated files at any time. Access is password-protected and data is encrypted.

Atrieva's SafeStation is so secure that one user testing it couldn't pry his password from Atrieva's staff when he forgot it. Aaron Cartozian, a manager with Seattle-based Ability Solutions, Inc., needed his password when two days after he began testing SafeStation, his hard disk drive crashed.

Cartozian eventually remembered the password on his own, and was able to take advantage of the service. "The lost data was all there on the backup Web server. I couldn't believe how easy it was," he says.

SafeStation, priced at $14.95 per month for unlimited storage and access, is primarily for mobile users and telecommuters.

Connected Online Backup is primarily for large companies that establish a central backup point, such as an intranet server. Connected provides volume pricing for corporations, but the per-user monthly fee is $20.

Intranet agenda

Here is a sampling of intranet-related conferences and expositions taking place this quarter.

Event	Date	Location	Organizer	Registration information
Internet Expo	Feb. 10-12	San Jose, Calif.	DCI	www.dci.com/internet, (508) 470-3870
Spring Internet World	March 9-13	Los Angeles	Mecklermedia	www.internet.com, (972) 620-3099 (fax)
Integrating and Advancing Intranets and Extranets for Financial Services	March 24-26	San Francisco	International Quality and Productivity Center	www.iqpc.com, (800) 882-8684
Internet Commerce Expo	March 24-26	Boston	IDG	www.idg.com/ice/
Measuring and Improving Intranet-Based Training	March 30-April 1	Chicago	IQPC	www.iqpc.com, (800) 882-8684
Comdex Spring '98, Expo Comm USA '98, Windows World	April 20-23	Chicago	ZD Comdex & Forums	www.comdex.com, (781) 433-1650

For a glimpse at how some companies are putting streaming to use on their intranets, see story on page 17.

Streaming sophistication

Latest wares deliver audio and video with more ease and better fidelity.

BY MARK GIBBS

For intranets blessed with plenty of bandwidth and decent desktop PCs, streaming products show themselves to good advantage.

The base line for display performance (frame rate and image quality) usually is that offered by MPEG-1. Although MPEG-1 requires 1.2M bit/sec — a considerable chunk of LAN bandwidth and an impractical requirement for dial-up connections — it offers excellent image quality and doesn't suffer from artifacts, which are bands of color, noise, pixelation and other irritations.

Artifacts usually are generated by the compression process. Frame rate is determined by bandwidth and display system overhead.

In most cases, the server or producer streaming software can run on Unix or Windows NT systems. A limited amount is available for Windows 95 and Macintosh systems. Players often can run on lesser systems with lower memory requirements. Of course, sound and video cards are necessary.

The first streaming video products delivered low frame rates — i.e., jerkiness — and poor-quality images. But vendors have been busy: The latest versions of streaming products are significantly improved.

Let the show begin

Vosaic LLC, for example, offers a streaming video system that provides an image of up to 352 pixels by 420 pixels. The system, called TVStation, is based on MPEG-1 with additional compression. Like its RadioStation streaming audio counterpart, TVStation relies on Java applets on the client for playback.

STREAMING BREAKDOWN

Product	CVideoNow	NetShow	RealPlayer	VivoActive	MediaStudio
Maximum Image size (in pixels)	320 by 240	320 by 240	320 by 240	352 by 288	352 by 240
Input	AVI	AVI, WAV	AVI, MOV, AU, WAV	AVI, WAV	AVI
Player	Standalone, Java	Standalone, Internet Explorer, Navigator	Standalone, Internet Explorer, Navigator	Internet Explorer, Navigator	Standalone, Internet Explorer, Navigator
Server OS	Windows NT, Unix	Windows NT	Windows NT, Unix	Any	Windows NT, Unix
Client OS	Windows 95, NT	Windows 3.1, 95, NT; Unix; Macintosh	Windows 3.1, 95, NT	Windows 3.1, 95, NT; Macintosh	Windows 95, NT; Unix; Macintosh

Vosaic also offers MediaStudio for creating streaming audio and video presentations, MediaServer for serving streamed video over the Web and MediaClient for receiving streaming video at the desktop.

Cubic VideoComm, Inc. offers CVideoNow, which it claims delivers a video stream comparable in quality to MPEG-1 video at 1.5M bit/sec over a connection of only 384K bit/sec. CVideoNow Producer, the utility for preparing video for streaming, uses proprietary compression technology to achieve ratios of 500 to 1.

CVideoNow offers developers fine control over image quality during the encoding process. The video stream is eight-bit color. Over a T-1 or 10M bit/sec Ethernet connection, CVideoNow can deliver an image of 320 pixels by 240 pixels at around 15 frames to 30 frames per second.

A CVideoNow server can provide streaming for as many as 100 concurrent users.

RealNetworks, Inc., formerly known as Progressive Networks, provides one of the richest product lines. Its streaming audio and video servers, for example, range from the free Basic Server to the RealServer configured for 1,000 concurrent streams. It also offers a range of content creation tools.

Last November, RealNetworks released RealSystem 5.0, a client/server streaming media system that includes RealPlayer, RealServer and publishing tools. Reviewers have been impressed with the improvements in video and audio quality and the straightforward tool kit.

Microsoft Corp. plays in the market with NetShow, which has no limitation on the number of streams served. Version 2.1, released last November, improves the encoding tools offered in the previous iteration.

Not surprisingly, since Microsoft has a stake in RealNetworks, NetShow supports RealAudio and RealVideo files. Version 2.1 adds NetShow players for the Windows 3.1, Macintosh and Unix operating systems. It also includes a beta release of NetShow Theater Server (derived from Microsoft's acquisition of Vxtreme, Inc.).

With NetShow, Microsoft introduced Active Streaming Format (ASF), the file format for NetShow content. ASF encapsulates multimedia content, such as images, audio and video, and embedded text, such as URLs, and can synchronize these objects within a stream.

The client comes as a standalone application, a plug-in for Netscape Communications Corp.'s Navigator or an ActiveX Control.

Vivo Software, Inc.'s VivoActive lets clients retrieve streamed content via HTTP. While this simplifies setup and operation, there's no server to ensure bandwidth optimization. VivoActive Player comes as an ActiveX Control and as a Navigator plug-in.

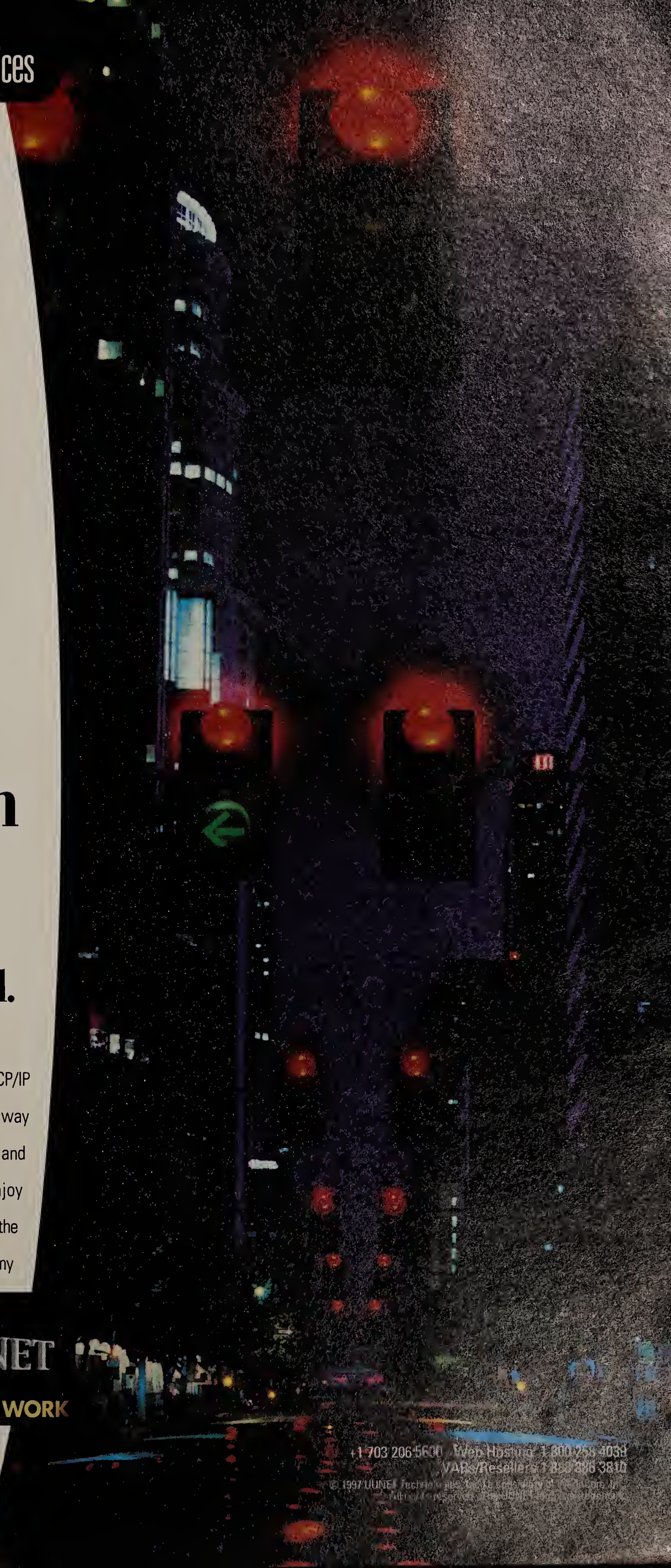
VivoActive is based on G.723 audio and H.263 video compression. The product can be used under NetShow, which provides more control features than the basic VivoActive. ⊜

STREAMING AUDIO AND VIDEO TOOLS

Here's a sampling of streaming products, as mentioned in this article.

Vendor	Contact information	Product	Pricing
Cubic VideoComm San Diego, Calif.	(619) 505-2030 www.cvideonow.com	CVideoNow 1.2	Server $2,900 for 20 streams, Producer free
Microsoft Redmond, Wash.	(800) 936-3500 www.microsoft.com/netshow	NetShow 2.1	All components are free
RealNetworks Seattle	(800) 444-8011 www.real.com	RealSystem 5.0	Basic Server free, Basic Server Plus $695, RealServer $5,995 for 100 streams, RealPlayer $29.99, RealEncoder free, RealPublisher $49.95
Vivo Software Waltham, Mass.	(800) 848-6411 www.vivo.com	VivoActive 2.0	Producer $495, Producer for NetShow $695, VideoNow $119, Player free, Power Player $12.95
Vosaic Chicago	(310) 315-9211 www.vosaic.com	TVStation, RadioStation, MediaServer	TVStation $1,800, RadioStation $1,295, Server $150 per stream, client free

[illegible] .com. Use DocFinder 5601.



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Circle Reader Service #4

Browser configuration kits: Simplify rollouts, updates

BY MARK GIBBS

Keep it simple. If there was a religion for intranet managers, this would be one of its commandments.

The trouble is, the difficulty of configuring applications on hundreds or thousands of desktops makes breaking the commandment easy — and sinning rampant. No wonder corporate-level configuration management has become IT's Holy Grail.

Even browsers, once so simple, have become complex: Netscape Communications Corp.'s Communicator requires 30M bytes of disk space and Microsoft Corp.'s Internet Explorer calls for a whopping 90M bytes.

This complexity becomes a serious problem when you need to change browser configurations for the many users on an intranet. Necessary changes may be as simple as adding a new set of mandatory bookmarks or setting a new default home page, or they may be as technical and crucial to operations as designating which proxy server the browser should access.

You can address this browser management challenge with corporate configuration kits from Microsoft and Netscape. The kits — Netscape's Mission Control and Microsoft's Internet Explorer Administration Kit (IEAK) — give intranet managers control over most features in the Communicator and Internet Explorer browsers. They provide documentation and guidelines for planning configuration and rollout, as well as software that performs the actual configuration and distribution.

KIT CONVENIENCES

Netscape's Mission Control and Microsoft's IEAK offer intranet managers a number of benefits, including the ability to:

- Centrally manage and control browser configurations.
- Create custom installation packages.
- Distribute browser updates.
- Authenticate distribution packages.
- Define push channels.
- Centrally manage security policies.
- Reduce support costs.

Mission Control is available for Netscape's Communicator 4.0, which runs on all versions of Windows, the Macintosh and several Unix flavors. It costs $1,995 or comes bundled with the SuiteSpot server suite. IEAK 4.01 is available at no cost for Internet Explorer 4.0, which runs on Windows 95 and NT 4.0.

Mission Control

The Mission Control tool suite uses a combination of HTML, Java and JavaScript. The Configuration Editor lets you set a range of user preferences, including a default start-up page, default news and mail servers, push channel settings and bookmark lists. The configuration files contain JavaScript scripts that the browser executes to modify the browser configuration.

Through Mission Control, you can program browsers to run periodic checks on a specific URL for configuration changes or updates to the browser software.

Mission Control also allows you to specify what product component sets to install: Communicator, Communicator Pro or the stand-alone Navigator browser. However, you can't specify particular components within those packages.

Mission Control's Java Archive Packager allows the inclusion of third-party applications in the installation package. The Page Signer, based on Netscape's Object Signing Model, packages and digitally signs Java applets, JavaScripts, plug-ins and other components to ensure secure, authenticated distribution.

IEAK

With IEAK, you use a wizard to set defaults for browser options such as mail and news servers and push channels. And, like Mission Control, IEAK periodically can read its options from a server.

Also, like Mission Control, IEAK allows you to configure custom installation packages. But unlike the Netscape kit, it provides control over which browser components get installed.

Microsoft's Authenticode system provides authentication. Authenticode uses digital certificates to establish a software publisher's identity and to verify that no one has tampered with the software. You can preinstall certificates, so users don't have to make decisions about downloading code on a case-by-case basis.

Also valuable is the ability to use IEAK for predefining Internet Explorer's security zone model. This allows for specific definitions of which servers are to be trusted and at what level.

Keeping the commandment

Both products are young and, as such, have a few rough edges — hardly surprising since Microsoft and Netscape are trying to keep pace with exploding feature sets. IT groups also are new to large-scale browser deployments, so the vendors face the challenge of trying to guess what features and facilities enterprises want.

Nonetheless, if you're running an enterprisewide intranet, you can't afford to be without these products — that is, if you want to keep things simple.

And you wouldn't want to break a commandment, would you? ⊜

Find more about Netscape's kit at http://search.netscape.com/comprod/products/communicator/mission_control/overview.html.

ASK DR. INTRANET

Please step in and lie down, Steve Blass is in for consultations. He understands the strains felt by people developing and managing intranets. Send your problems to dr.intranet@paranet.com.

Internet Web servers are denying access to my intranet clients with static IP addresses because of Domain Name System (DNS) reverse lookup errors. I've installed "named" on our SunSoft, Inc. Sol[illegible] server, which successfully communicates updates to our Internet service provider's DNS server, and I can ping the cli[illegible] from the Internet. So why won't the reverse DNS lookups work?

Via the Internet

You can solve this problem by including the reverse lookup information in your DNS database files. This is sometimes called "named.rev" and provides the DNS database for the in.addr.arpa domain, which maps IP addresses backwards into host names.

After creating named.rev, edit named.boot to include named.rev and restart the "named" process. You can use nslookup or dig to verify that your IP address-to-host name reverse lookups succeed.

Can I provide secure intranet access for roaming Windows 95 clients using Microsoft Corp.'s Point-to-Point Tunneling Protocol (PPTP) through generic Internet PPP connections?

Via the Internet

Yes, and here's how. You'll need a multi-homed NT PPTP/remote access server with one interface on your intranet and another on the Internet. The clients will need PPTP software, which you can get from third-party vendors or as part of Microsoft's Dial Up Networking Windows 95 upgrade. The latter is available for free at www.microsoft.com.

After you've upgraded, double-click on Dial Up Networking's Make New Connection icon, choose Microsoft VPN Adaptor in the Select A Device box and enter a server IP address. These actions will create a Dial Up Networking icon for the PPTP server.

To use PPTP, users would connect to your ISP with PPP and double-click on the PPTP server's Dial Up Networking icon. This establishes an encrypted tunnel from the client to the intranet PPTP server over the Internet.

Check out Microsoft's Knowledge Base for helpful server routing and remote access server configuration tips for extending the PPTP tunnel throughout the intranet.

Blass is a network architect at Houston-based Sprint Paranet, a distributed computing systems services provider.

[illegible] e2 default.asp.

Living in your own private Idaho

Client-to-LAN VPN software allows remote users to access the company Web securely. Here's a look at how some of the leading products rate.

BY JOEL SNYDER

Remote access via the Internet is cheap. Unfortunately, it's also insecure and unreliable.

But fear not: You can solve the security problem using client-to-LAN virtual private network (VPN) technology.

We tested five VPN products: InfoExpress, Inc.'s VTCP/Secure, Axent Technologies, Inc.'s PowerVPN, Aventail Corp.'s MobileVPN, Compatible Systems Corp.'s IntraPort and VPNet Technologies, Inc.'s VSU-1010/VPNremote. Based on our testing, we prefer VTCP/Secure for the simplicity of its client and power of its server.

PRODUCT SCORECARD

Product	Client installation and management (45%)	Server management and features (25%)	Client platforms supported (15%)	Server filtering (10%)	Performance (5%)	Overall score
InfoExpress VTCP/Secure	8	6	8	6	6	7.2
Axent PowerVPN	7	7	8	6	6	7
Aventail MobileVPN	6	6	8	7	5	6.35
Compatible Systems IntraPort	7	6	5	6	5	6.25
VPNet VSU-1010/ VPNremote	6	7	5	6	7	6.15

Individual category scores are based on a scale of 1-10. Percentages are the weight given each category in determining the total score.

Be aware, however, that the products we looked at are not your only alternatives. *Network World* recently reviewed several LAN-to-LAN VPN products, many of which include client-to-LAN capabilities (*NW*, Nov. 10, 1997, page 58). In particular, products from Digital Equipment Corp., Microsoft Corp., RedCreek Communications and TimeStep Corp. are worth evaluating for their client-to-LAN capabilities.

Go online for more information on VPN products and strategies.

NetworkWorld Fusion www.nwfusion.com

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All client-to-LAN VPNs have two parts: software that runs on the remote client, such as a Windows PC or Macintosh, and a server at the central site. When operating correctly, the client and server form a tunnel, transmitting encrypted packets over the Internet and providing the client secure access to resources at the corporate LAN.

InfoExpress' VTCP/Secure, Axent's PowerVPN and Aventail's MobileVPN are software-based (we tested each on Windows NT Server). Compatible Systems and VPNet provide dedicated hardware VPN servers.

While the client side is architecturally similar in each product, the server varies widely, from Windows NT add-ons to dedicated hardware. And, unfortunately, none of these products are compatible — each vendor has taken a different approach to building VPNs.

The client has the key

Remote access is a nightmare for support desks. Staffers never know what combination of CPU, modem, operating system and software configuration they're going to have to support. Adding VPN software makes it worse.

For that reason, we looked most closely at the client side of the VPN: how easy it is to install, configure and manage.

Client support varies from product to product (see Table 1, page 12). None of the products we tested support Macs or Unix, and some only work with Windows 95.

We found InfoExpress' client software (also used in Axent's PowerVPN) and Compatible Systems' IntraPort the easiest to get going, thanks to well-constructed installation procedures. We were up and running without any phone calls and just a glance at the documentation — a good thing in Compatible Systems' case because the documentation is razor thin.

VPNet was slightly more difficult to install, while Aventail's software — a SOCKS Version 5 client — was the most complex. Because Aven-

PRODUCT CAPSULE

Product:	VTCP/Secure	PowerVPN	MobileVPN	IntraPort	VSU-1010/VPNremote
Vendor:	InfoExpress	Axent	Aventail	Compatible Systems	VPNet Technologies
Contact information:	(650) 969-6924 www.infoexpress.com	(800) 298-2620 www.axent.com	(888) 762-5785 www.aventail.com	(303) 444-9532 www.compatible.com	(408) 445-6600 www.vpnet.com
Price:	Client $89 Server $1,495	Client $94 Server $2,995	Client $49 Server starts at $4,995	Server $2,995 (Eight client sessions)	Client $99; server hardware starts at $4,995; management software starts at $3,995
Pros:	Easy to install and use the client, low cost, wide range of platforms, compression	High-security authentication, easy to install, wide range of platforms, compression	Wide range of platforms, LAN-to-LAN and LAN-to-client	Low cost, easy to install, IP and IPX tunneling	Integration of LAN-to-LAN and LAN-to-client, hardware performance, compression
Cons:	Requires Windows NT or Unix server	Complex combination of servers from two vendors	High cost, need separate certification authority to generate keys	Difficult to make server changes, not for large number of clients	High cost, requires LAN-to-LAN VPN

tail's generic client can be used with any SOCKS Version 5 server, some of the complexity comes from not hiding features, such as multiple simultaneous VPN support, that most VPN users would not want.

But ease of installation isn't always a good thing: In many cases, the easier the client is to install, the less secure it is.

This is because the client has to share some information with the server. Without shared information, the client cannot be sure that it's talking to the right server, and vice versa.

A password is shared information and is easy to enter, but it is not very secure. Most of the VPNs we looked at let the client off easily with simple passwords. In an environment in which client spoofing is a real fear, passwords may not be sufficient protection.

TABLE 1: CLIENT SUPPORT

Product	Windows 95	Windows 3.1	Windows for Workgroups	Windows NT
InfoExpress VTCP/Secure	X	X	X	X
Axent PowerVPN	X	X	X	X
Aventail MobileVPN	X	X	X	X
Compatible Systems IntraPort	X	-	-	-
VPNet VSU-1010/ VPNremote	X	-	-	-

A more secure model is using public keys and certificates to positively identify both ends of the connection. Unfortunately, these are big chunks of data to type in. As such, the network manager may have to distribute a diskette to each VPN user.

Token security

Axent has taken a different tack with PowerVPN. It has combined its tried-and-true one-time challenge-response token system with the client and server offered by InfoExpress. VPNet's VPN solution also supports hardware tokens, giving the network manager the option of using SecurID hardware tokens from Security Dynamics Technology, Inc. as an authentication system.

With the PowerVPN approach, the end user requires a password and a hardware token for building a tunnel. This assures the server side that it's talking to the real client.

Axent also offers a software version of the token. It is less secure than the hardware approach but is easier for remote users who would otherwise have to use their hardware token every time they log on.

Our greatest surprise was how easy it was to build VPNs with these products. We ran into some problems, but they were easily fixed. We had anticipated bigger problems because the VPN digs deep into the heart of the client PC.

Note, however, that we were only using standard Microsoft TCP/IP stacks. If you plan to use Windows 3.1 or Windows for Workgroups, you'll want to check compatibility with your TCP/IP stack.

Managing the mess

The VPNs we evaluated included graphical user interface management software for server and clients. Server management software is simple and was not a distinguishing factor among the VPN products.

One major difference among the products is the way they handled user authentication information. InfoExpress, Aventail and VPNet let the network manager use a standard remote authentication database such as Remote Authentication Dial-In User Service (RADIUS) or Terminal Access Controller Access Control System.

Local authentication with a simple user/password file also is available in InfoExpress, Aventail, Compatible Systems and VPNet products.

The Aventail product also works with the Windows NT authentication system.

Compatible Systems' VPN router had the weakest client management among the products tested. The IntraPort server maintains client information in flash memory, and it requires a server reboot to change user information.

Although the hardware-based approach is inherently high-performance, it clearly is not designed for large numbers of end users. IntraPort is inappropriate for environments in which a lot of moves, adds and changes take place.

Protocols such as RADIUS appear to solve these issues, but the problem runs deeper. VPN client information also includes access controls for designating what services the client can use. All VPNs support access controls on a per-client basis, but merging and managing the controls with a third-party RADIUS server is a complex task.

VPNet and Aventail have suboptimal RADIUS configurations. They require substantial coordination between the local and RADIUS databases. The InfoExpress and Axent servers have the smoothest interconnections and allow the RADIUS databases to contain all client information.

Other management features, such as logging and reporting, vary from product to product. None of the features stand out for their strengths or weaknesses.

VPN servers built on an existing operating system have an inherent advantage with their built-in file systems. However, even those servers based on dedicated hardware provide a way for a management console to receive auditing and logging information.

Picking a style

Although client installation and management will be critical to a successful project, different environments require different VPN architectures.

InfoExpress and Axent have a software-only solution that uses NT or Unix servers to handle the server end of the VPN. Aventail has the same strategy, but adds LAN-to-LAN VPNs to its software.

VPNet's hardware is a combination client-to-LAN and LAN-to-LAN VPN. By centralizing the touch-down point for all VPNs, other security management, such as poking the appropriate hole through the corporate firewall, can be simplified and centralized.

However, VPNet also could be a performance bottleneck. This is because the product has to sit between the secured network and the rest of the world.

Compatible Systems offers a different, scaled-down approach. Its IntraPort server's low cost and relative simplicity make it particularly attractive to organizations with a small and relatively static remote access community.

Because most remote access VPNs are limited by the slow speed of their modem links, performance isn't usually a major consideration for client-to-LAN VPNs. Nevertheless, the generally speedier hardware-based VPN servers also are more reliable because there are no other applications on the same system, and they can be less expensive than software-based servers.

Putting it all together

VPN services are, at least for a time, a single-vendor purchase.

Although LAN-to-LAN VPNs are firmly moving in the direction of standardized protocols for encryptions and key management, client-to-LAN vendors have yet to agree on a single method (see Table 2, page 12). Part of the reason for this is the capability set.

For example, while Aventail uses the relatively mature Secure Sockets Layer and SOCKS protocols, it doesn't handle User Datagram Protocol (UDP)-based applications very well or IPX applications at all.

As the VPN market decides what capabilities and functions are required in client-to-LAN VPNs, products will begin to converge on a single set of interoperable protocols. This situation complicates your buying decision. You should attempt an extended pilot rollout with your chosen vendor before making any commitment to large-scale deployment.

TABLE 2:

Product	Encryption	Key exchange
InfoExpress VTCP/Secure	Proprietary tunnel using DES40/DES/3DES encryption	Diffie-Hellman
Axent PowerVPN	Proprietary tunnel using DES40/DES/3DES encryption	Diffie-Hellman
Aventail MobileVPN	SOCKS Version 5 tunnel over SSL using RC4/DES	Proprietary
Compatible Systems IntraPort	Generic Routing Encapsulation tunnel using DES	Secure Tunnel Establishment Protocol
VPNet VSU-1010/ VPNremote	Proprietary tunnel using DES/3DES	Simple Key Management for IP

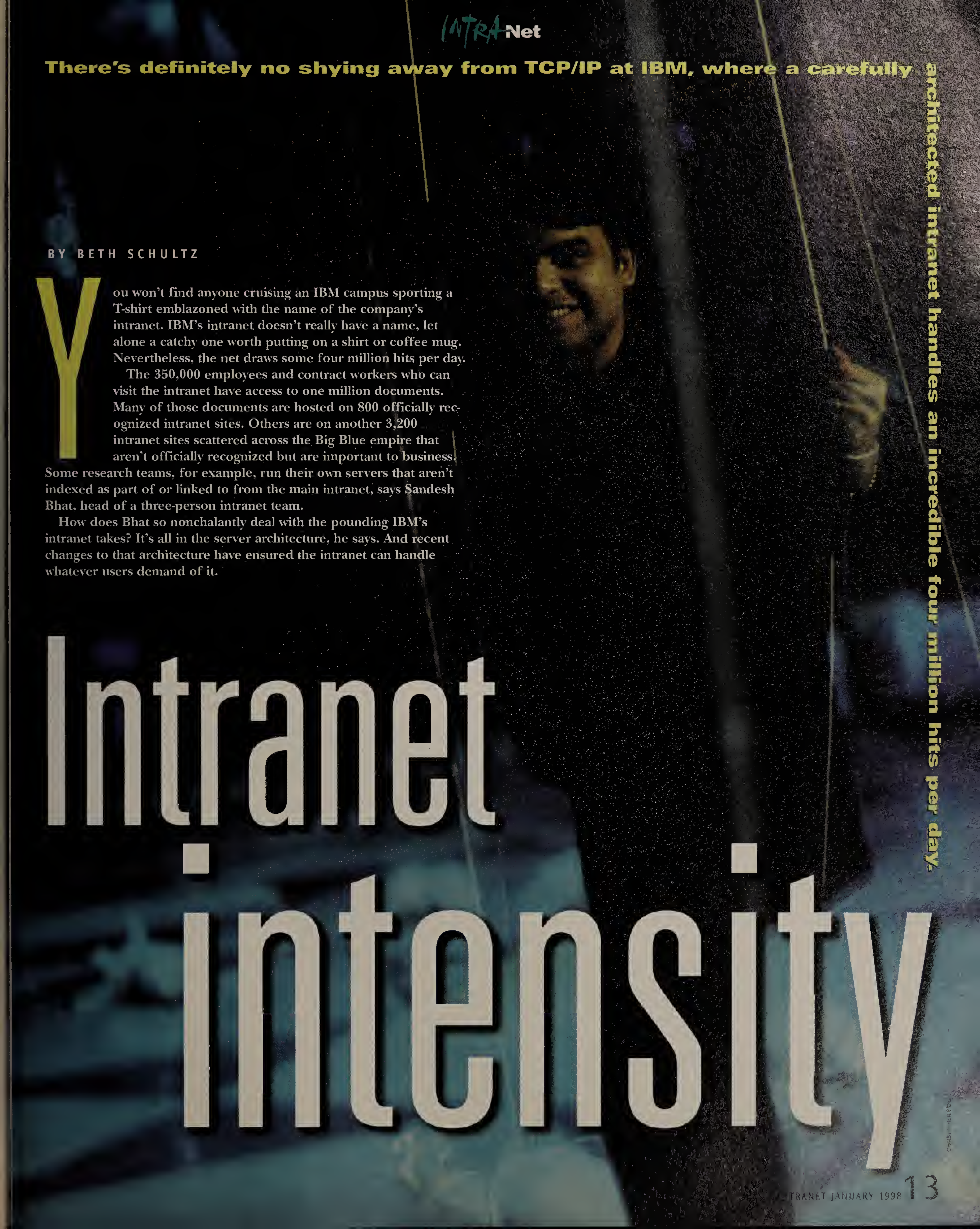
One particularly important issue to note when evaluating these products is addressing. Will the client have access to VPN services only on the corporate LAN? Or will the client also be allowed to communicate with the insecure network, either directly or by bouncing through the secure net? What address will the client see, and will it be compatible with all applications and protocols?

You must know your application and protocol mix before selecting a product.

To pick the best remote access VPN product, you need to consider end-user installation and compatibility, management, security model and longevity — all moderated by budget.

Snyder is a senior partner at Opus One, in Tucson, Ariz. He can be reached at jms@opus1.com.

For a related story, see page 21.



There's definitely no shying away from TCP/IP at IBM, where a carefully architected intranet handles an incredible four million hits per day.

Intranet intensity

BY BETH SCHULTZ

You won't find anyone cruising an IBM campus sporting a T-shirt emblazoned with the name of the company's intranet. IBM's intranet doesn't really have a name, let alone a catchy one worth putting on a shirt or coffee mug. Nevertheless, the net draws some four million hits per day.

The 350,000 employees and contract workers who can visit the intranet have access to one million documents. Many of those documents are hosted on 800 officially recognized intranet sites. Others are on another 3,200 intranet sites scattered across the Big Blue empire that aren't officially recognized but are important to business. Some research teams, for example, run their own servers that aren't indexed as part of or linked to from the main intranet, says Sandesh Bhat, head of a three-person intranet team.

How does Bhat so nonchalantly deal with the pounding IBM's intranet takes? It's all in the server architecture, he says. And recent changes to that architecture have ensured the intranet can handle whatever users demand of it.

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Server scenario

In September 1996, the corporate intranet was based on an IBM RS/6000 F30 running IBM's Internet Connection Server (ICS) Web server software and hosting File Transfer Protocol (FTP) and DB2 database servers. The ICS server, since renamed Domino Go, processed 62,000 HTTP requests per day, Bhat says.

By August 1997, the number of hits had grown to 1.7 million per day and publishing requirements were diverging — the intranet team had to add a Lotus Development Corp. Domino 4.5 server so employees could publish content from Lotus Notes databases on the Web.

INTRANET INSIGHT

Sandesh Bhat, technical manager and Webmaster for IBM's corporate intranet, is responsible for keeping the snarls out of the company's massive Web. Here are some things he's learned along the way:

1. Pick people with the right skills and expertise, from marketing, technical departments, sales, human resources and other disciplines, to create the team to support your intranet.

2. Build community among your departmental Webmasters. A successful intranet requires strong working relationships among content providers.

3. Begin your intranet planning with scalability in mind. Plan for intranet usage to grow by orders of magnitude beyond original expectations and requirements. Recent studies show that the return on investment for an intranet is directly related to how much it can do. If yours is to be successful, design it with an architecture that will accommodate hypergrowth.

4. Build support for participation among end users, engaging them in the process of determining what resources and capabilities should be incorporated into your intranet. Internet technologies and the Web are agents for change in an organization — be sure to reach out to your end-user community to make sure that your intranet meets their needs and requirements, or else they may not use it.

5. Make sure you have support in the executive suite. Although intranets and Web sites work best when designed and driven by the grass-roots people who live and breathe the technology, be sure that your project has support from the top. Empowerment of the intranet project by company executives is essential to success.

Adding another Web server to the RS/6000 forced the team to rethink its intranet architecture. At issue was running more than one Web server under a single URL and IP address/host name and balancing the load between the servers, Bhat says.

The intranet team decided the answer was putting individual servers on dedicated processors in an RS/6000 SP high-performance parallel system. Users still only would have to remember one URL and IP address/host name; IP traffic management software would mete out the requests to the appropriate servers.

So Bhat's intranet team installed one 12-node RS/6000 SP chassis and began populating it with the various servers it needed for dealing with intranet traffic. It filled seven slots with production servers:

- Two nodes run Domino Go for serving static HTML pages.
- Two nodes run Domino 4.5 for activating Lotus Notes databases on the intranet, as well as for regular groupware and e-mail functions.
- One node acts as an FTP server.
- One node secures and encrypts transmissions using the Secure Sockets Layer standard.
- One node is for DB2 database transactions and SQL queries.

The intranet team also stocked the server complex with four standby, or backup, nodes. These are for use during traffic spikes, such as when the IBM masses head to the intranet to get a streamed presentation of Chairman Lou Gerstner's annual address, Bhat says.

And in the last bit of rearchitecting, the intranet team fronted the server complex with an RS/6000 running IBM's Interactive Network Dispatcher IP traffic management software. They knew the software would have no problem doing the job: A four million daily hit count is paltry compared to what Interactive Network Dispatcher has handled out on the World Wide Web.

Interactive Network Dispatcher was used to front end servers at the 1996 Summer Olympics (18 million hits on the busiest day) and the 1997 Masters golf tournament (more than 12 million hits per day). What's more, Netscape Communications Corp. uses the software to handle traffic at its Web site, which gets approximately 40 million hits per day.

On the IBM intranet, all browser requests now come into this server. From there, the Interactive Network Dispatcher software distributes the requests to the appropriate back-end nodes. For example, all requests coming into Port 21 — the FTP port — are forwarded to Node 4, the FTP server in the complex.

Interactive Network Dispatcher's job gets tougher when it comes to distributing HTML requests among the four Web servers — two Domino Go and two Domino 4.5 nodes. It uses a patented algorithm to dynamically distribute traffic according to the available capacity of each server. Interactive Network Dispatcher acts as a "TCP sprayer," IBM likes to say.

Head online for more information on IBM's intranet, including:

- **An intranet schematic**
- **Details on the products comprising the net**

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Within a month and a half of the team's move to this architecture, the number of daily intranet hits skyrocketed to the four million mark at which it is now holding steady. Bhat attributes the surge to the server complex and Interactive Network Dispatcher — the improved performance encourages and facilitates use.

The RS/6000 SP has plenty of horsepower for handling well beyond four million hits per day, Bhat says. He anticipates a rapid increase in hit counts in the next six months as new applications come online.

Across the Big Blue sea

Bhat and his team also plan on bolstering the corporate Web to improve service for global users. For example, they have deployed proxy servers at several international locations so each request isn't being handled by the server complex in New York.

Once a page is requested, it is cached on the local proxy server. Subsequent requests for the same page are handled by the proxy rather than the host server, reducing the amount of time a user waits for the download.

The intranet team also is conducting bandwidth studies to determine the best locations in Europe and the Asia-Pacific region for mirroring the New York server complex. Once the mirrored sites are up, the intranet managers will rely on local routers using the Open Shortest Path First protocol to direct intranet traffic to the nearest mirrored site.

Another Interactive Network Dispatcher feature will kick in once the mirrored sites come online, Bhat says. The software's Interactive Session Support component can balance Web requests among multiple WAN sites.

Establishment of the mirrored sites also makes it possible to publish content in the native language of each site. IBM language translation programs will do the conversions on the fly.

The final major architectural initiative the intranet managers have undertaken is the deployment of IBM/Transarc's DFS, a distributed global file system. DFS's caching feature allows HTML files published on the intranet's main server complex to be replicated immediately to all the mirrored sites.

Intranet traffic from Europe and the Asia-Pacific region will not have to transverse IBM's cross-Atlantic backbone to get to the data stored in the New York server complex.

These intranet-specific efforts are part of a grander scheme for adding WAN connections and large-scale server platforms. Actually, IBM now considers its intranet the real enterprise network because most employees are traversing the corporate Web to get to the information and applications they need for doing their jobs, Bhat says.

Topping that, most new applications in IBM are intranet- or Internet-oriented, so network planning revolves around the Web anyway, Bhat says. Intranet applications include streaming media, threaded discussion groups, Notes discussion groups, live news feeds, people directories, search engines and transaction processing.

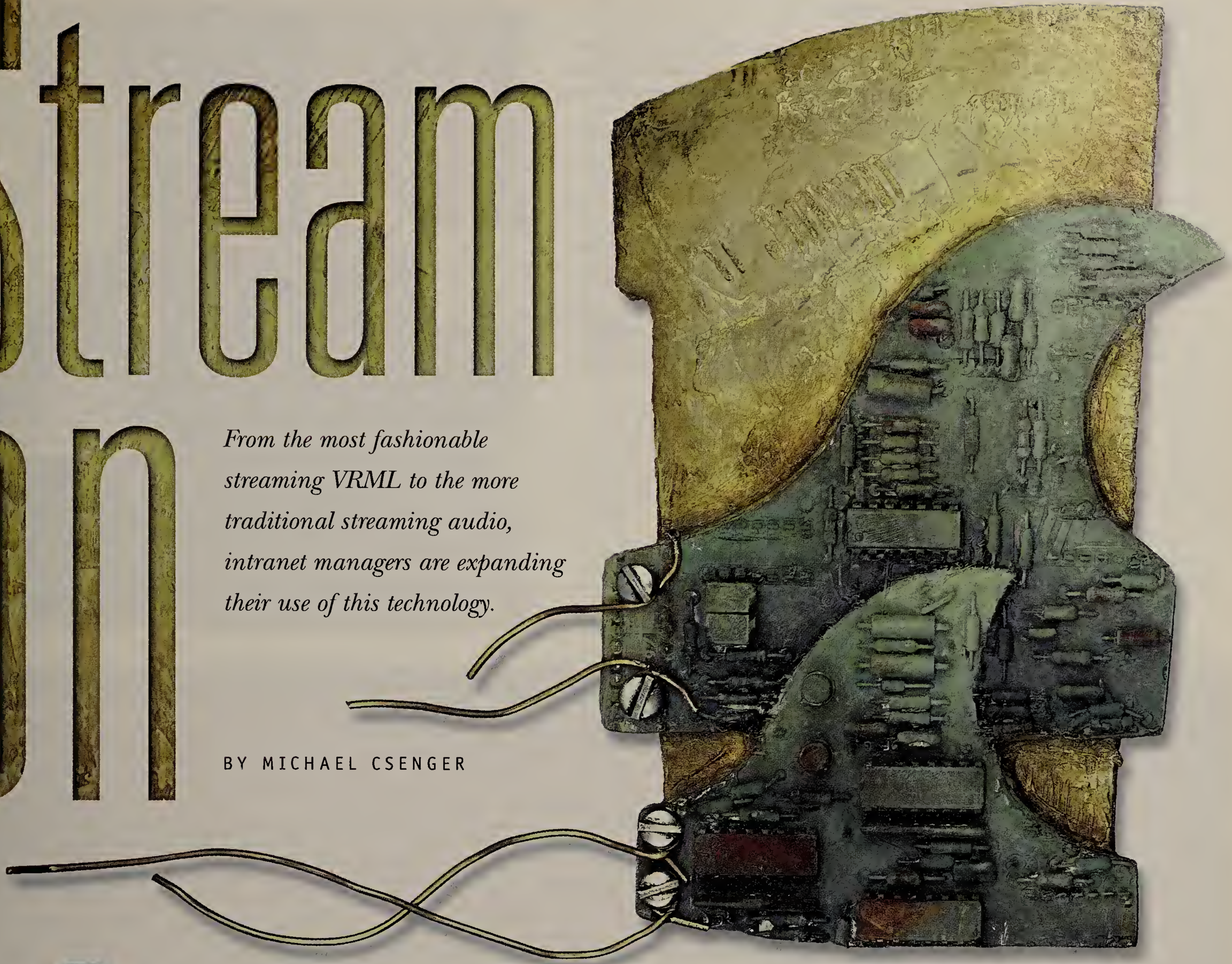
In addition to these applications, the intranet team maintains a site for downloading corporate-approved software, such as the Netscape Communications Corp. Navigator browser it licenses, and another for downloading multimedia presentations.

The corporate intranet team registers about one new, full-fledged intranet site per month, Bhat says. That's not too bad for a company mired in Big Iron legacy. ⊜

Stream on

From the most fashionable streaming VRML to the more traditional streaming audio, intranet managers are expanding their use of this technology.

BY MICHAEL CSENGER



STEIN LOKEN

Adventurous intranet managers are finding that streaming media can breathe life into Web applications and bring networks closer to an ultimate sensory experience. But poorly used, the technology begets ragged audiovisual props aspiring to infomercial quality, experts caution.

Intranet managers early on began lacing corporate Webs with streaming technology, starting with audio tools for playing sound files on the fly. Today, video and animation with synchronous slide presentations augment that streaming sound, and the suite of corporate applications that uses streaming technology is diverging to play several distinct roles.

Because return on investment (ROI) is most easily pegged to existing needs, streaming applications often land in an established area such as corporate training. They easily pick up where the hassles of CD-ROM delivery or live broadcasts leave off, providing new ways of doing old things more cost-effectively.

But new business potential is emerging.

Black and Veatch, the world's largest builder of power plants, puts streaming to use to the technology's utmost. The Kansas City, Mo., firm designs, finances and constructs large-scale developments, such as chemical factories and petroleum refineries, around the globe.

Industrial revolution

Whereas most users think of streaming media as a sensory enhancement, Black and Veatch Chief Technology Officer John Voeller believes it will revolutionize management of massive industrial projects.

Streaming technology describes a means of browsing large files in real time, so users can access them more dynamically. For example, rather than waiting the half-hour it might take for an entire 5M-byte video clip to download before they can play it, users can begin viewing a streamed video as it's being received.

The technique relies on dynamic compression and decompression between dedicated servers and client software. Most systems require proprietary browser plug-ins, but a trend is emerging to use quick Java applets instead.

Black and Veatch is working toward the next dimension of this basic streaming concept. Its business depends on enormous CAD files which are the lifeblood of any manufacturing or engineering process. Vital as they are, CAD systems block streamlined project management because they're proprietary and only can run on pricey, dedicated workstations.

Project partners who need to review a construction detail have to get to an engineer's workstation and then open the entire CAD file, which easily can be 300M bytes. Sharing such files across a network is difficult, and swapping disks leaves files vulnerable to inadvertent editing, revision mismatch or security breaches.

Black and Veatch recently started working with Envision3D, a streaming media tool from Adaptive Media, Inc., in Sunnyvale, Calif. Envision3D does for CAD images what streaming does for video: It only sends the part of a file a user is viewing and updates the scene as it unfolds. This spares bandwidth and lets browser-equipped users interact with complex design systems.

The Envision3D streaming tool uses the Virtual Reality Markup Language (VRML) standard for animated 3-D Web content. Envision3D leverages the fact that most CAD systems

See Stream, *page 19*

INDUSTRIAL-STRENGTH STREAMING

One measure of streaming media's potential is the fact that some traditional, extremely conservative companies such as British Petroleum, John Deere and Black and Veatch are beginning to consider what the technology might do for them.

This increasing broadmindedness is related to emerging standards for the creation and exchange of traditional meat-and-potatoes industrial information.

The International Standards Organization is working on a series of standards in five areas of product data technology. One, the Standard for The Exchange of Product model data, comprises AP221 for functional data and schematics, AP227 for plant spatial configuration and AP231 for process engineering

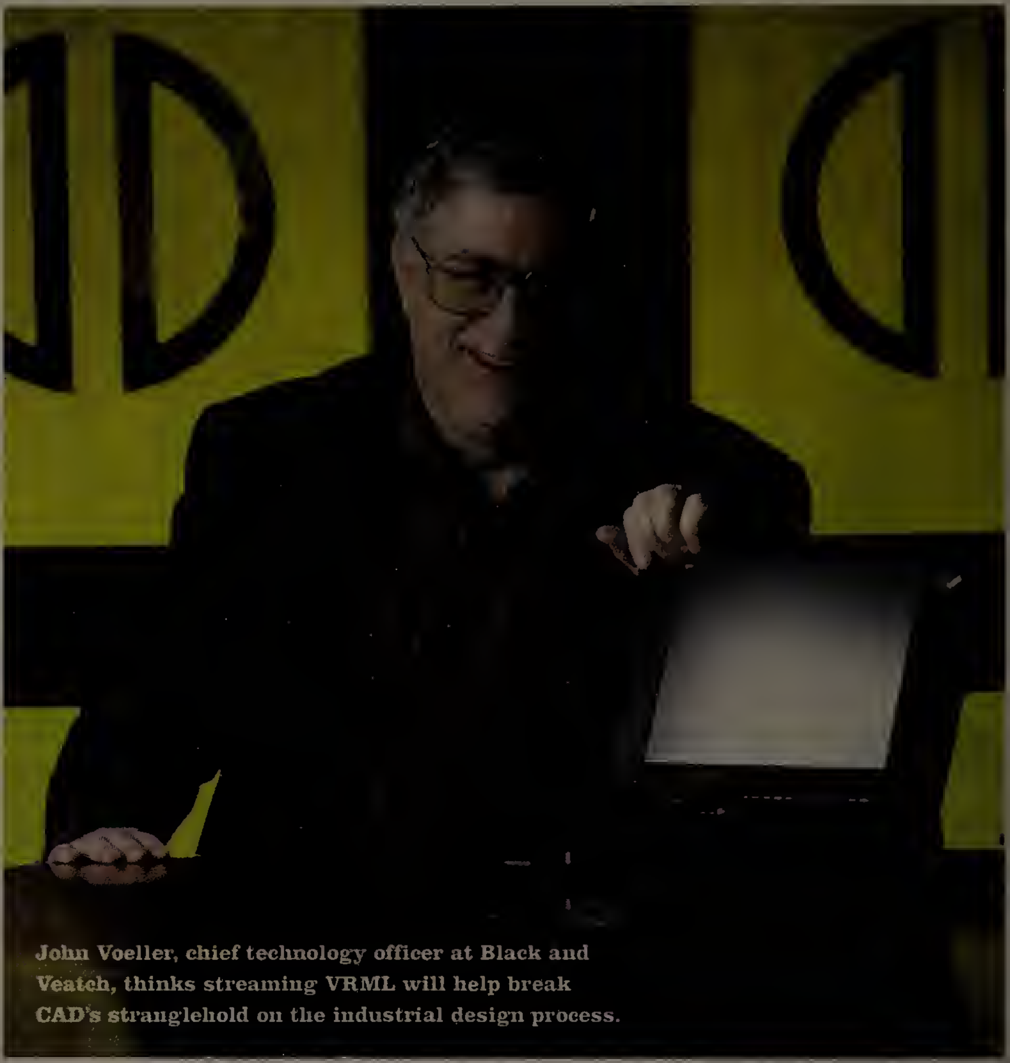
AP227 addresses the sort of streaming three-dimensional CAD imagery that companies such as Black and Veatch intend to pursue. The standard should be complete and commercial implementations underway by the second half of 1998.

A user group called PieBase also is involved in these efforts. Representing the interests of companies that build and own large industrial process plants, PieBase is focused on wresting control of these data standards from the "techno-weenies," in the words of John Voeller, chief technology officer at Black and Veatch, a power plant builder in Kansas City, Mo.

"We want to make sure these solutions are business-based, not just technology-minded," Voeller says.

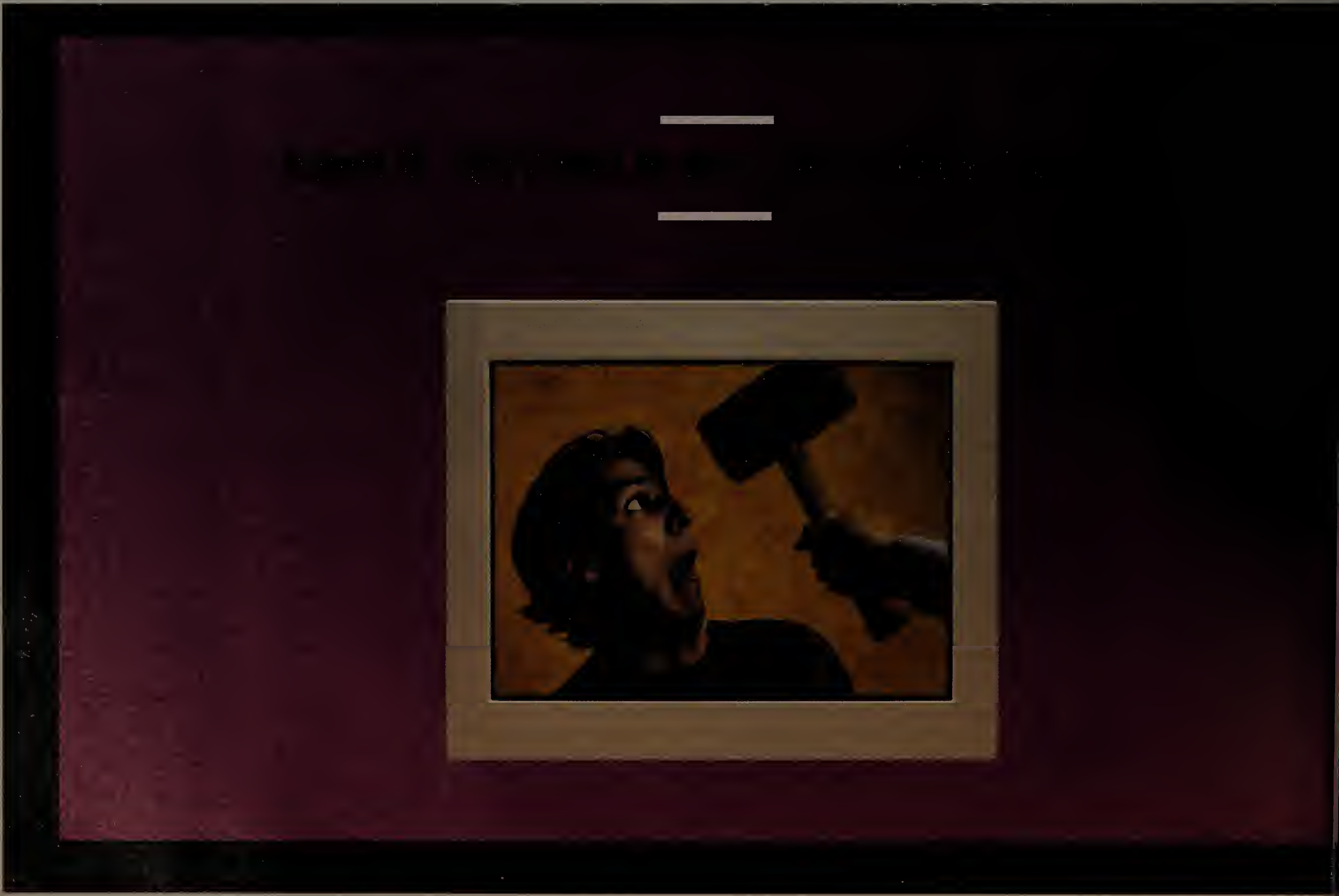
For more information on these initiatives, check out www.nist.gov/sc4, http://cic.nist.gov/plantstep and http://cic.nist.gov/piebase.

— *Michael Csenger*



John Voeller, chief technology officer at Black and Veatch, thinks streaming VRML will help break CAD's stranglehold on the industrial design process.

ED LALLO



Stream, *continued from page 17*

can output design files in VRML format. By streaming the resulting VRML file, any Web browser with Adaptive's client software can open the images and tour the parts of a design. The Envision3D server conveys just the elements of a room or system that a user is examining, then refreshes the scene to move along or zoom in for a closer look.

"You can move through details of a complex object, but at no time does your machine have to manage the total information," Voeller says.

And because it's a viewer, Envision3D is more flexible than a CAD system. "The problem with CAD systems is that if you can open the information, you can screw with it," Voeller says. "With streaming, a person can do their job interrogating CAD data without being on a CAD seat and touching the data or getting into [restricted] areas."

Voeller is helping Adaptive refine the product so it will allow logical context viewing. Construction managers would be able to view CAD renderings but only look at the stuff they have to install over the next four weeks, for example. A viewer would hit the CAD file and the scheduling database, then meld the information with a manager's inventory. This would show what items are going in and code them according to shipping status, Voeller explains.

"This goes beyond what most people call streaming media," Voeller says, adding that it comes at a time when big industry is settling on standards for the sort of information swapping that will enable the scenario he describes (see sidebar, page 18).

Moving pictures

Streaming VRML may be the hot topic in big industrial firms, but desktop audio and video remains the more familiar, mass-marketed side of streaming media. A myriad of vendors, content developers and systems integrators play in this field, as do pundits who offer varied perspectives on the technology's potential in enterprise applications.

Streaming is big on the Internet, with its use often tied to media events and TV shows. But its business use in intranets is limited by "early, crude" technology, says Mark Hardie, a senior analyst at Forrester Research, Inc., in Cambridge, Mass.

"The end product just isn't of high enough quality that people are willing to rely on it on a regular basis," he says. "People talk a lot about training applications, but what are you really getting out of a herky-jerky, quarter-screen training video on your monitor?"

Likewise as a corporate communications tool, streaming media falls flat, Hardie argues. "Most face-to-face meetings come with a whole lot of in-person collateral. That's why you spend the money to conduct business," he says.

Go online for a sampling of streaming media vendors

FIND IT ON FUSION 5605

Streaming media proponents dismiss such arguments. "We can't pretend that this replaces human interaction, but it can be a great way before a meeting to bring everybody up to speed," says Marty Roberts, product manager of intranet solutions for RealNetworks, Inc., the Seattle-based company, formerly known as Progressive Networks, that dominates this market.

Corporate interest in streaming technology started picking up in the fall of 1996 when RealNetworks released RealAudio 3.0, which allows synchronized audio/Web presentations that support self-directed training applications.

The addition of more robust capabilities and the general uptake of intranet solutions continues to drive interest. Convenience, expediency and ROI are bywords of the corporate sphere.

GE Information Services (GEIS), for example, started using RealNetworks' technology last spring for communications and training applications that save money and improve user experiences.

GEIS holds quarterly meetings at which the CEO addresses all 2,000 employees, some in person but many others scattered in 65 locations worldwide. It was a logistical nightmare, says Trudy Wonder, GEIS' international communications manager.

At headquarters, for example, 800 employees share a conference facility that can only hold 200, so the CEO had to conduct each meeting four times in two days. "That's a lot to ask of a CEO every quarter, so when we presented him with a proposal to integrate video broadcasting into the program, we got the sign-off," Wonder says.

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Circle Reader Service #1

GEIS now streams the meetings to participants who can't attend in person. It sends audio, video and slide presentations across its intranet. "It's a terrific improvement," Wonder says.

GEIS also implemented a training application that replaces the earlier classroom requirements for sales certification. Streaming video is used, for example, to present customer-assessment scenarios. The training modules reduced each course from one week to two hours and have significantly raised overall proficiency, Wonder says.

Cashing in on ROI

Justified by straightforward training and communications ROI, streaming media can be leveraged to support broader ambitions in the scheme of corporate information exchange.

Knowledge sharing is a good example. Ernst & Young LLP develops training courses and seminars as part of its consultancy service. The firm videotapes programs — up to 20 or 30 hours worth every month — during live satellite broadcasts to clients around the world. It then offers the videotapes to people who miss the original program but decide they ought to have the material.

"The content was generally a one-shot deal," says Dale Coyner, executive producer of new media for Ernst & Young, in Vienna, Va. "People would rarely sit down and play the tape."

Ernst & Young recently started pulling three or four clips from each of these video productions and packaging them in streaming video. The streaming updates are available to employees on the company's intranet and to clients on a private Web site. "It's a way to build our thought leadership, to get our point of view out and tell people what's happening," Coyner says.

But there's a catch to recycling corporate information: walking that fine line between re-use and refuse.

STAN BOROUGH

Streaming video gives Ernst & Young LLP a new outlet for its research, says Dale Coyner, executive producer of new media.

The streaming audience is a sophisticated tough sell, says Brad Grove, creative director of film, audio and video at Eagle River, Inc., a multimedia content developer in South Portland, Ore. "They've downloaded plug-ins to view this stuff, and if you give them late '80s-style industrial video or a bunch of talking heads, they'll tune out."

So far, the people putting together streaming content mainly are programmers and marketing staffers who don't have backgrounds in media arts. "The craftsmen with experience in telling a story through media images are just starting to work in this field," Grove says. Their judgment can make the difference between a stiff talking head and a crafted mix of sights and sounds.

Streaming media's innovation ends at the margins of a PC screen. From there it plays on our senses to the exacting degree to which they're accustomed. When the technology looks and sounds as good as anyone might expect, users will still want to know: "What's the point?" The best tools and applications will make their purpose clear. ⊜

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SEMINAR OVERVIEW

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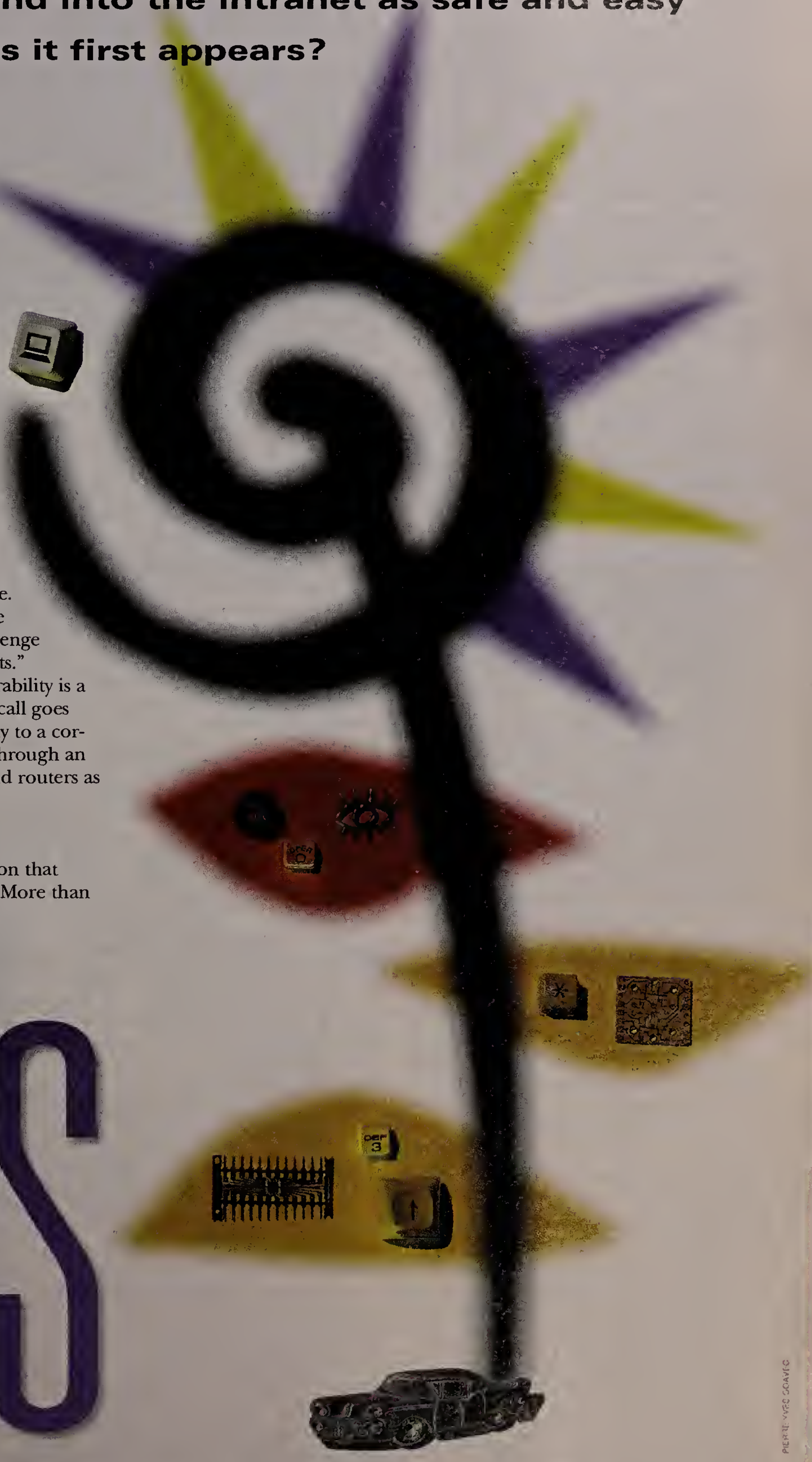
Tapping roots

Web technology offers remote and nomadic users easy access to the home office. But is surfing across the 'Net and into the intranet as safe and easy as it first appears?

BY PEGGY WATT



PIERRE-YVES GOAVEC

Bringing remote and roving users into the corporate intranet forces IT managers into a balancing act. They've got to weigh the simplicity of browser-based access via the Internet against the security of older methods.

Web-based access definitely has ease of use in its favor. Browser-equipped remote users make a local call to the Internet. Once connected, they enter the URL or click on the assigned bookmark for the corporate Web. Entering a valid password usually gives them access to the same resources — Webified legacy databases, e-mail and applications — as their onsite peers.

As companies Webify traditional data sources, remote users potentially enjoy greater access to corporate information than previously. Users praise the functions they get when employers put Web front-ends on data warehouses, for example. Before the Web, querying and reporting tools were reserved for researchers versed in the art of online transaction processing.

Salespeople, among others, value this accessibility. While at customer sites they can tap into the intranet and pull down data on products in stock or pricing, for example.

But should that data be sailing across the Internet? That is its route, if the user is browsing into the intranet instead of using the older method of connecting directly into a LAN gateway.

"Whenever you connect a wire to the Internet, you're opening yourself up to possible compromise," says John Telford, a principal at Infomax Consulting, Inc., in Portland, Ore. "The mechanisms to gain remote access are not so much of a challenge as figuring out the security aspects."

The Internet's primary vulnerability is a lack of security. While a dial-up call goes over a public line, it goes directly to a corporate server and doesn't pass through an anonymous chorus of servers and routers as it would over the Internet.

Popular quandary

A lot of IT managers are out on that wire, trying to find the balance. More than

108 million employees worldwide will work outside traditional office settings by 2002, according to a study by the market research firm Gartner Group, Inc., of Stamford, Conn. And just because the users won't be at headquarters doesn't mean they won't need or expect access to the data stored there.

IT managers are finding there's no single access solution, and probably few permanent ones, in the changing world of Web technology.

Piscataway, N.J.-based Chanel, Inc., part of a global company headquartered in Paris, is building an extranet to facilitate communications among its dispersed salespeople.

Chanel has implemented RemoteWare Express, an extranet-based transaction tool from XcelleNet, Inc., in Atlanta, to send and verify order information between sales staff and central offices. The browser-based access is easy for the 150 salespeople, who use hyperlinks for navigation. They connect through the Internet and a Windows NT-based remote access server (RAS).

Giving the sales staff a browser interface to corporate data is proving easier to manage for users and IT, says Joe Slattery, a senior programmer. The salespeople are getting access, through the Web tools, to more data than they previously could retrieve remotely.

Go online for a sampling of vendors offering remote intranet access products.
FIND IT ON FUSION 5602

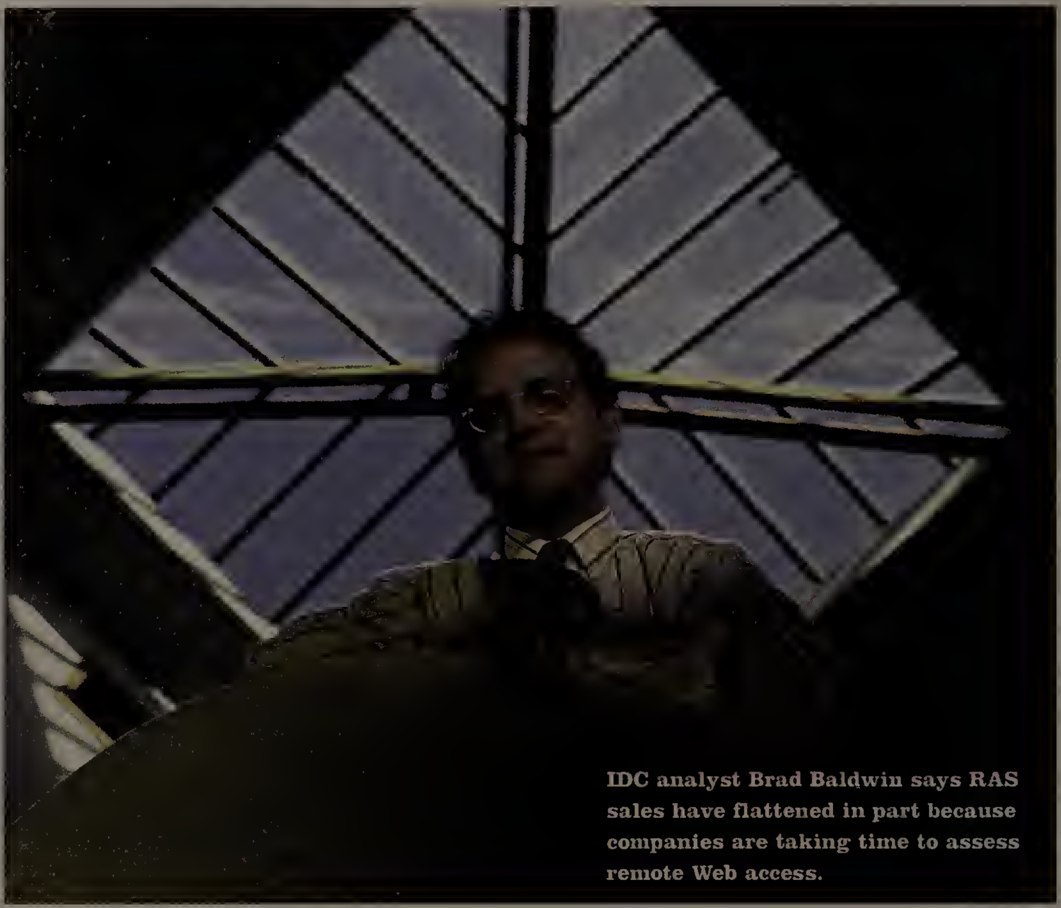
Chanel also is testing RemoteWare Express Software Manager, which can securely distribute software updates to remote and mobile users when they access the extranet. The company is studying access and work patterns to determine the best methods for broadcasting data and program updates to the remote users, Slattery says.

Like XcelleNet, vendors that have long offered remote access tools are reassessing and revamping their product offerings to accommodate the Internet as the route of choice and a Web infrastructure at the destination. If users can come into the corporate LAN through an intranet, companies no longer will need a modem bank for direct-dial connections into a RAS. Neither will they need to manage multiple points of presence, since each user makes a local call to the Internet.

In traditional remote access configurations, the RAS that acted as the gatekeeper to the corporate LAN also handled authentication and security — functions a network manager does not want to give up just because remote users enter an intranet via the 'Net.

So some companies keep the RAS, but add a switch intended to handle extranet access. That switch sits between the Internet and a virtual private network (VPN) leading to the intranet.

The extranet access switch integrates network communications (protocol and services) with routing functions, authentication, bandwidth management and interaction with the corporate firewall. New Oak Communications, Inc., in Acton, Mass., markets one such switch — the NOC 4000.



IDC analyst Brad Baldwin says RAS sales have flattened in part because companies are taking time to assess remote Web access.

JASON GROW

Companies can retain their existing RAS and still take advantage of an Internet connection in other ways. Funk Software, Inc., in Cambridge, Mass., for example, recently expanded its Remote Access Communications Suite with an Internet gateway that acts as a secure router. It allows browser access to Novell, Inc. IntraNetware servers.

Even companies without direct 'Net connections can link to an Internet service provider from a RAS port.

Getting virtual

"We think [VPNs] through service providers will be the big trend for '98 [when it comes to intranet access]," says Brad Baldwin, director of remote access at International Data Corp.'s Mountain View, Calif., office.

Most major carriers, including AT&T, MCI Communications Corp. and Sprint Corp., offer VPN services, as do smaller data services providers, such as IBM Global Services and GE Information Services. Most carriers use tunneling protocols to ensure privacy across their backbones.

Tunneling software encapsulates IP packets inside encrypted packets for transport through a temporary point-to-point connection. A firewall at the source encrypts and encapsulates data to send it; one at the destination opens, authenticates and decrypts the data.

"It's the same issue whether you're dealing with roaming users or an extranet with business partners," says Julie Bort, a Silverthorne, Colo., analyst who follows security standards development.

For example, a financial officer might be accustomed to retrieving up-to-the-minute corporate sales information from a central repository, often through a browser interface to a legacy database that produces HTML reports on the fly. When the executive is traveling, that same proprietary information could be available safely via a VPN.

For long distances, a VPN is an ideal solution for remote access, Telford says. He recommends such a setup for a client with offices in Hong Kong and the Pacific Northwest to beat the astronomical cost of dedicated circuits.

Deciding to use a VPN is the easy part. Once IT managers have made that choice, they have to pick among several competing tunneling protocols. The choice primarily comes down to the Microsoft Corp.-developed Point-to-Point Tunneling Protocol (PPTP) and the Internet Engineering Task Force's IP Security (IPSec) protocol.

In a typical scenario, PPTP runs on the remote Windows client and a Windows NT Server providing Web, proxy and routing services. A traveling employee makes a local Internet connection and enters the Web address of the company extranet.

COLIN FARRELL

Julie Bort, a security analyst, delves into the remote intranet access issue in her book, ***Building an Extranet***.

The client sends a user ID and passwords for the ISP and the RAS. The server recognizes and admits packets only from the remote user. The server also can send an ID for the remote program to authenticate.

Bort cautions that PPTP may be a short-lived solution, even though it may be well-supported. That's because Microsoft is working on its successor — Layer 2 Tunneling Protocol (L2TP).

IPSec supports the use of multiple encryption algorithms, including variations of the Data Encryption Standard, for a stronger encryption than PPTP. It also is used with tunnels involving firewalls and routers and resides on both client and server.

At the least, companies giving remote users intranet access over the Internet should take advantage of the Secure Sockets Layer (SSL) standard, Bort says. Designed by Netscape Communications Corp., SSL is widely supported in both servers and browsers.

If intranet managers aren't satisfied with security currently available for Internet access, they still can require users to dial up a RAS directly but allow them to do so through a browser interface. They can implement the same password and even encryption protection, but avoid the public network.

Remote tools get Webbed

Even third parties are enhancing remote access tools for Web play. Take Traveling Software, Inc., in Bothell, Wash., for example. The vendor, which is well-acquainted with nomadic users through its LapLink file-sharing and update program, now markets Point B Remote Net-Accelerator.

The software, which resides on the browser-based client and the RAS, speeds remote transmissions through caching. It caches data on the client and then, after comparing what's on the client to what's on the server, only sends updates. "Point B is middleware in any PPTP or VPN solution," says Clemens Butz, product manager.

Host access vendors are being especially conscientious about partnering on Web connectivity. Remote host access — getting into the corporate databases with the same privileges as a local client — obviously raises security concerns, but all major host access vendors have browser-enabled their tools. They are adding support for Java, ActiveX and other Web technologies and are teaming with RAS, switch and port vendors to ensure the security of host applications accessed via an extranet or intranet.

And the next big thing? According to Baldwin, faster communication through cable modems and digital subscriber line technologies will provide more secure VPNs. The intranet bounds, it seems, may be limitless. ⊜

LEAN AND MEAN

BY MARK GIBBS

Trimming a few thousand bytes from image files can make all the difference for users downloading Web pages.

Unless you're into bogging down users with unnecessarily large downloads, optimizing intranet content should be one of your priorities.

The problem is, maximum performance — i.e., minimum download time — comes from small, text-only pages. But delivering maximum information usually requires graphically rich pages.

On an intranet, performance relates to the size of everything contained on a Web page. Typically, the text portion isn't a problem — HTML files only average 2K or 3K bytes, with 25K bytes being the upper limit. And, optimizing an overly large page is not hard. You simply break it into a number of separate pages, then link all the pages together.

But a typical Web page also includes content that has to be loaded. These nontext components usually are images, but we're seeing more use of multimedia pages that include, for example, video files averaging 100K byte. Plug-ins, ActiveX Controls and other content interpreters add even more overhead.

In the quest for efficient delivery, exotic content always is a problem. Never use multimedia when an alternative can get the message across without the overhead.

Image problem

Unnecessarily large pages and exotic content aside, the biggest Web performance overhead comes from embedded images. The average Web page generally has two such images, each of which requires approximately 25K bytes. Image data, then, is generally at least twice the size of HTML content.

You definitely need to optimize images. But, to do that, you need an understanding of image attributes and how browsers and PCs handle images.

The most popular Web browsers support two image formats: GIF and JPEG. Plug-ins, ActiveX Controls or external helper applications are needed to handle other formats — formats you should avoid if you're trying to optimize Web content.

The GIF and JPEG formats are “raster” images. This means grids of dots, called pixels, make up the images. Each pixel has an associated color value and other attributes specified by one or more bits.

The number of bits depends on the color depth, which is the term for the number of colors used in the image. Black-and-white images require one bit per pixel.

The human eye supposedly resolves millions of colors; the most common approximation for this in the computer world is “true color,” which requires 24 bits per pixel to allow for 16,777,216 colors.

Color data can be stored in image files in two ways. Storing true color data requires three bytes (24 bits) per pixel, one byte each for red, green and blue (RGB) values. So, for a 100-pixel-by-100-pixel image, you need a total of 30K bytes (10,000 pixels times three bytes per pixel).

However, for images that use 256 or fewer distinct colors — usually sufficient, since most monitors are limited to displaying 256 colors — storing the RGB values for each pixel would be a waste of storage. So instead of keeping an RGB value for each pixel, a Color LookUp Table (CLUT) is stored in the image file. Each pixel now is described by only one byte that points into the CLUT, a list of 256 RGB values, each a set of three bytes.

For 100-pixel-square images, you now require 10,768 bytes — 10,000 bytes for the image plus 768 bytes for the CLUT. This total is just more than 35% of the true color encoded size.

You could reduce the file size using compression. At a 10:1 or better ratio, you might be able to skinny down an image file to 3K bytes, for example.

Herein lies the key to image optimization: The more you can compress an image, the faster it will download.

The ability to compress a file is not related to the number of colors — the palette size — in it. Rather, it is a function of the type of image and the compression algorithm and ratios.

The compression algorithm, which is part of the file format, determines how the compression will be done and whether image data is lost in the process. High levels of compression, because they require dropping some data, reduce image quality. Some image compression algorithms let users select the compression ratio so they can control image degradation.

Compression algorithms look for patterns of same-colored pixels or repeating color sequences, then encode the patterns to reduce the file size. Results depend on the data input.

Each file format is appropriate for a different image type. Note that when using GIF files, you can't select the compression factor. On the other hand, most graphics programs let users specify high, medium or low compression for JPEG files.

For Web use, most experts recommend modifying an image's palette so no more colors are used than is necessary. This ensures that the compression algorithm will have a smaller range of colors to work with and therefore will be able to find more and longer sequences to encode.

Before you get into such advanced techniques, consider the number of images on your intranet. If you think you can convert a few thousand images to use an optimized palette, think again.

A more realistic goal for optimizing image content on a large intranet is to ensure that the right file type is used for a given image. In general, line drawings and flat-color illustrations are better stored in GIF format, while photographs and complex images are more suitable for JPEG format.

Beyond GIF, JPEG

You can expect to see the emergence of image formats offering better compression and applicability to any image content. For example, the World Wide Web Consortium has elevated the Portable Network Graphics (PNG) format to recommendation status.

PNG in many ways is an improved version of the GIF format in that it has better compression, a larger palette and better transparency support. Its sophisticated display standard specifies 48 bits per pixel, with up to 48 bits for color or 32 bits for color and 16 bits for alpha channel. This allows for the specification of more than 64,000 levels of transparency per pixel.

Transparency is crucial for producing sophisticated Web pages that allow backgrounds and other content to show through images. With multiple levels, the image can be opaque, transparent or anything in between.

Despite this sophistication, PNG does not support multiple images. This means you can't animate images like you can with GIF.

Get Your Web Fit!

Following these five rules will keep users from breaking into a sweat when downloading intranet pages.

1. Whenever possible, break long text documents into separate pages and don't mix high-level content (information) with low-level detail (data).
2. Don't use video or other exotic content unless you expect a payoff. Remember: Just because you animate an image doesn't mean it conveys more information.
3. Don't use complex images when simple ones will do. This applies not only to content – using simple diagrams instead of photographs – but also to color – using simple flat blocks of color rather than complex graduated fills.
4. Use thumbnails for large images. Let users click on the thumbnail if they want the image at a higher resolution.
5. Choose the image format that best suits an image's attributes – GIF for diagrams and JPEG for photographs – and required use. For example, if you need transparency, then you'll have to use a GIF image.

Microsoft Corp. and Netscape Communications Corp. support PNG in the Internet Explorer 4.0b1 and Communicator 4.04 browsers, respectively. Nonetheless, it'll probably be at least another six months before PNG is used widely given the market's commitment and reliance on GIF and JPEG.

As long as intranet developers use the correct image format and build well-constructed pages, you'll have addressed most of the opportunities of optimizing Web content. Now if you could just get users to be more selective about what they publish! ⊜

Go online for a guide for determining which format best suits your Web image.

5604

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Circle Reader Service #5

Q&A

Show me the value!

When wearing her consulting hat, Harvard Business School professor Lynda M. Applegate stresses the need to identify how IS investments will deliver value.

KATHY TARANTOLA

MIS executives are often less than enthusiastic to hear the CEO has hired Lynda M. Applegate to come in to do some consulting work. Applegate, a Harvard Business School professor teaching courses in general management, MIS and organization design, just loves to force people to quantify what value they're getting from their IS investments. We caught up with Applegate on the plush Harvard campus to gather her thoughts about intranet value.

Where do intranets fit into your research on how companies can benefit from technology? Are they the silver bullet IS has been looking for?

No, they're not the only answer. The major role of technology in organizations is to improve processes and leverage information. And the targeted impact can be either inside or outside the firm.

Inside the firm, the biggest opportunity to add value is to use technology to redesign a process. Companies are also using Internet technology to leverage information, to help people make decisions and take actions differently — really change the way the organization does business.

Once you've built these capabilities inside, they can be extended to the outside. Managers can integrate processes across organizational boundaries to improve supply chain management or distribution, for example. These are frequently thought of as extranet systems. You can also leverage information to add value to existing products and services or create new products and services.

Then there's another category of value that involves the use of Internet technology to streamline, simplify and add value to the infrastructure itself. In this case, a firm can decrease the total cost of technology ownership. There are some tremendous opportunities there that haven't even begun to be tapped.

Value is one of your chief battle cries. If you have an intranet in place, how do you identify how and where to use it to deliver value?

Usually it's a combination of the two things I just mentioned. The most immediate impact coming from the redesign of a core process — what I call high-leverage, high-leakage processes — a key area of activity that is important to the organization and has a tremendous amount of inefficiency today.

The Internet can be used to help integrate and streamline the process, and if that high-leverage, high-leakage activity also interfaces with the outside, then you're forming a foundation for electronic commerce in the future. Frequently targeted processes include, for example, sourcing on the supplier side and sales force automation on the customer side.

As companies use the Internet to streamline and add value through process improvement, they can implement critical parts of the infrastructure that are going to be required. So you're layering in infrastructure while you add value — infrastructure being the networks, the

> "In '94 I was working with companies that were studying what impact the Internet would have on commerce. So I went back and looked at how technology had influenced electronic commerce in the past, and the history lesson basically said start inside. Set up the systems required to manage and coordinate the process inside, then you can extend the system to outsiders."

INTRAVIEW Q&A

> "Everyone at the time was saying disintermediation; get rid of the middle people. And I looked back and said, uh-uh. Market theory doesn't say that. Market theory and history say when technology is introduced, the role of the market facilitator becomes more important. [illegible] cross the electronic channel."

new protocols, the links to databases and the new databases that may be required.

How do you assess value when you're using the technology to help overhaul a process?

You measure process performance improvement in terms of cycle time or cost reductions or quality improvements. If your goal is to improve knowledge worker decision making, you have to look specifically at how you measure the performance of that worker.

For example, one company I studied found they were able to reduce the time required for salespeople to hit quota from four months to two months, which added $600,000 in revenue. That's measurable.

Do you think MIS managers have a clear understanding of how to look for value?

No. There's a lot of confusion out there. There were some MIS people at one of my recent conferences, and they came up afterwards and said, 'We've never had to justify our activities. We just know that this makes good business sense because it links to strategy.'

As technology became an important part of the business, the link to ROI became less clear. Lacking traditional measures, people just started taking it on faith that technology was critical. Most of the senior managers I talk to are tired of taking it on faith. They want to know where the value is.

When you consult with companies, do you work with upper management or MIS or both?

I typically work with upper management, but MIS also gets involved. I'm hoping MIS will get more involved. But my work is usually with senior business line managers.

To what degree do these folks know about intranets? Do they care? Is it a term that is bandied about?

You have to be living on the moon right now not to have heard about intranets. They know about it, but they have two basic concerns: The first is that until this year the tools for really integrating well with existing infrastructure were rudimentary at best. And the second thing is security, which is still a big deal.

Most executives don't really know what the security problem is. They've just heard it's bad, and you can't do anything secure using Internet tools. New technologies are enabling companies to create more sophisticated security systems for doing business across secure virtual private networks and that is helping.

Is upper management getting more demanding about things like ROI?

Yes. They're getting upset with seeing all this money going out the door, especially now that they're being held more accountable by their shareholders. They've got to justify it, but no one's really able to put their hands around how to quantify value.

People hate to see me walk in the door because I've been draconian. I force people to start thinking about ways of quantifying value.

But intranets are notoriously low-cost.

Right. What people are saying is that it doesn't cost that much so let's go do it. What I'm saying is, it doesn't cost that much and that's important because we're reducing total cost of ownership, but you can't reduce cost if you don't know what you're spending.

I've gone into companies and said, 'Do you know how much you spend on information technology?' I sent every one of the executives in my last program home with a set of questions that had to do with 'How much are we spending today?' They didn't have a clue.

And the numbers are huge.

And the numbers are huge. They're huge. And when they hear them they choke.

How is this all related to the age-old IT productivity paradox, that all this spending on IT doesn't provide a commensurate boost to productivity?

It all depends on how people are measuring productivity. And for many years all of those IT productivity studies were done using large databases and looking at the end results — you know, earnings and earnings per share, etc. So they were looking at publicly divulged kinds of statistics on organizational productivity as it relates to macro measures.

The problem with that is you can't control for what the technology was supposed to do and everything else that went on in the organization that could influence that end measure.

If you look at productivity in terms of more micro measures, of process performance improvements, we definitely can show the impact of technology on our processes and on productivity and performance within a process orientation or an activity orientation.

Where we've had much more difficulty is trying to find ways of measuring information productivity where you give technology to a knowledge worker and are measuring productivity at the individual level. The problem with that has been, again, that we don't have good measures for looking at the performance improvements, or we haven't used those measures in the studies themselves.

You've done a lot of work on collaborative environments. If anything, you would think that intranets would make it a lot easier to launch team-based initiatives, but we hear less and less about teams. Are organizations still pursuing teaming, or have they washed their hands of the concept?

The ability to use technology to allow people to work in fluid and flexible kinds of work relationships is extremely important now, much more so than in the past.

I think what you're seeing is the link between the Internet and team-based technology just now being formed. People may be focusing on the tools — Internet technologies — more than the impact, but I think most people assume the team is important.

I've been working with a number of start-ups and they have to grow in Internet time. I mean, they get big real, real quick. And the need for collaborative virtual kinds of organization becomes much more important.

You've got organizations growing through the collections of small groups of individuals who are not required to be located in the same physical location. That's becoming very much of a factor of life in organizations today, especially organizations that are tackling Internet-based business opportunities.

But teaming happens more naturally in small companies. How about in large companies?

I have lots of examples of how big companies are using technology to make decisions and take action — say a design team that includes people in different parts of the world, and maybe in different organizations, that uses the network to share information and make decisions.

That's happening. If you go back 10, 15 years you would find that people were physically co-located. That is no longer true today.

How much of it is due to the Internet? While we've had e-mail for many years, most large companies had multiple competing communications protocols. You can't quickly form work teams if people can't talk with one another.

What the Internet created was a common set of protocols and services and tools that enable much more flexible communications.

But there are still information hurdles. We still need to retrofit all of our systems and applications to "talk" Internet. The capability is there, the vision is there, but in large companies the reality is not quite there yet for many. ≡

INTRAVERT • MARK GIBBS

Lights, camera, action!

What if no one had to shout, “Lights, camera, action!”? What if movies, radio, compact discs and tapes didn’t exist? Our culture would be far less rich and information would flow much slower. By today’s standards, it would be a low-bandwidth world.

Yet low-bandwidth information delivery is somewhat the nature of the PCs on our intranets. We’ve got huge amounts of computing power, vast disk stores and fat data pipes everywhere — all the support needed for great productions — but the picture is flawed.

We think of the PC as the quintessential business tool — our window into a world of information and knowledge. Even though they can show us a lot of data, PCs definitely are second-rate display tools.

JOEL NAKAMURA

For starters, monitors have a screen resolution of approximately 76 dots per inch (dpi). That’s awful!

If someone gives you laser printer output at 300 dpi, you’ll probably moan and complain about the poor quality. Yet you expect yourself and your co-workers to sit for hours on end in front of monitors that have only slightly more than one-quarter of the resolution. Worse still, the poor resolution is combined with poor color rendition, flicker and lousy contrast.

And it is not as if you’ve got much choice — that’s as good as monitors get without spending a ridiculous amount of money.

So because of the characteristics of our primary display device, it is imperative to present information as efficiently and effectively as possible. Text presents a difficulty.

To get a decent amount of information on a monitor, the text must be small. But the smaller the text, the less legible.

However, text by itself is a thing of the past. With intranets, the effectiveness of information presentation has improved because it’s easy to include graphics. As a consequence, our presentation techniques have expanded. We’re realizing that the structure of online content is significantly different from paper content.

Consider a product brochure: It’s full of information and data, which sometimes seems to be mixed with wild abandon. But we’re used to the format, so it works. What we’re not used to is having that same document dropped onto a PC. It doesn’t work at all.

The product brochure needs to be restructured significantly to work online. The content needs to be divided into information about the brochure’s subject and supporting data. Information such as product name, features, visuals and cost fall into the former category while data such as height, weight and power requirements make up the latter.

Once you’ve figured out how to decompose the document, you need to reassemble it into a structured presentation. The goal is to let readers drill down as much or as little as they need.

If you’re going to get really clever, you’ll need to add more sophisticated presentation tools such as Macromedia, Inc.’s Shockwave and Java applets.

Please note that I don’t consider the use of Adobe Systems, Inc.’s Page Description Format (PDF) at all advanced. It’s just a way of showing what paper versions of documents look like online and, although document producers might add navigation that is not possible with paper copies, PDF documents rarely make effective online presentations.

Sometimes, even the most advanced document presentations fail. This tends to happen when complex ideas need explaining and messages need to be presented and absorbed quickly. In these situations, audio and video work better than plain text.

Streaming video works well on PCs even given the limitations of most monitors. And adding audio is cheap — most new PCs come with audio. These factors will create great opportunities for putting streaming media to use on intranets (see related story, page 17).

For example, streaming media will have an enormous impact on corporate training. Today you feel compelled to send people to training courses because you know that comprehension and retention with in-person training is far better and quicker than with book-based training. Tomorrow, you’ll have people sit at desktops that will be plugged into Web-based distance-learning programs.

And there’s that product brochure on your Web site today. While your carefully crafted online version works well, it would have much greater impact reincarnated as a video presentation.

You’ll see another jump in effectiveness when these streaming media presentations start to get really sophisticated. By embedding hyperlinks in streams, for example, users will be able to jump from one stream to another via a mouse click. But the transition to streaming media won’t be easy. Your challenge will be to develop a vocabulary of techniques for streaming audio and video because those media are not like any other with which you’ve come to grips. It’s one thing to produce streaming audio and video content but quite another to produce compelling content.

To get ready for this new media, start checking out the streaming products and try applying them to your information. I believe you’ll find compelling uses in next to no time. Oh, and perhaps you’d better start practicing that “Lights, camera, action!” thing.

Ready for the shoot? Send your scripts to imcolumn@gibbs.com or pitch your ideas at (800) 622-1108, Ext. 7504.

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Circle Reader Service #3

Is the Justice Department justified in going after Microsoft's bundling practices?

Mark Gibbs Dave Kearns

> *"A wise and frugal government, which shall restrain men from injuring one another, which shall leave them otherwise free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned. This is the sum of good government."*
> – **Thomas Jefferson**

Consider Windows 95 — 13 million lines of code for $95. Do you hear consumers complaining that the product is too expensive? No. If they did, Microsoft wouldn't be doing as well as it is today.

Nope, the sound you hear is that of disaffected techies, the monumentally uninformed and the anti-Microsoft lobby whining about irrelevancies. And in response, the Department of Justice is trying to hit Microsoft with an antitrust suit. Again.

Introduced in the U.S. by the Sherman Antitrust Act of 1890, antitrust legislation has two objectives: To assure consumers the low prices and high quality that flow from effective competition, and to assure fairness — a level playing field — for the entrepreneurs who provide vital competition. (I borrowed these definitions from the Antitrust Law & Economics Review Web site at http://webpages. metrolink.net/.) But the truth is, antitrust laws are not what they appear to be. Just consider that the Sherman Act was pushed into law by pressure from the railroads and the competitors of John D. Rockefeller, America's first billionaire. Simplifying the issues, the Sherman Act was put in place to clip Rockefeller's wings — protecting consumers was not the real agenda at all.

The pretext under which Janet Reno is trying to clip Microsoft's wings is further alleged violations of antitrust legislation and breach of its 1994 settlement. And what is it that the Department of Justice argues? It claims Microsoft's business practices are bad for the consumer (at $95?) and its OEM contracts are unfair and in breach of antitrust laws. What nonsense.

Microsoft consistently has pushed product prices down while increasing the virtual bang for the software buck, thus providing a foundation for the industry's exponential growth. Sure, Microsoft writes tough OEM contracts, but the OEMs *don't have to sign*. So why is Microsoft being singled out? Success. The truth is, Microsoft is only guilty of being a fierce and successful competitor and of realizing an American dream.

What concerns me more than anything else about this case is that if the Department of Justice wins, it will have done so in part by successfully defining what constitutes an operating system. This will open the door for action anywhere in our industry from any government agency driven by any special interest group with an ax to grind. Our industry will suffer as constraints, laws and rules breed out of control.

You think the cryptography export laws are stupid? Just wait until the government can call the shots for the computer industry in general over operating systems, browsers and whatever else it pleases.

I urge you to oppose the Department of Justice as vociferously and stridently as possible. This isn't just about Microsoft. If we fail to protect Microsoft — to defend a marvelous example of the free market — we will have taken the first step in destroying the most vibrant market on earth, and we'll have handed the government a few more of our basic rights to dispose of.

Gibbs monopolizes Network World*'s weekly Backspin column. Flames and bouquets to nwcolumn@gibbs.com. Special thanks to Stefan Jovanovitch for advice on antitrust law.*

Thomas Jefferson said the best government is that which governs least. It's a principle I agree with. Certainly I have no wish to see the government proclaim standards for computer operating systems. A casual read-through of the proceedings of the government-sponsored International Standards Organization, especially as they relate to computers, shows this is an area governments should stay out of — except as a last resort.

But Jefferson also said one of the fundamental reasons to have a government is to protect us from those more powerful than ourselves. In the computer industry, Microsoft is more powerful than any other entity.

Few consumers want to buy computer systems in a piecemeal fashion. Gateway 2000's recent TV ads tout the fact that its computers include everything you need, as opposed to those companies that make you purchase the monitor separately. Yet even those unnamed companies include an operating system with their PCs, and that operating system is invariably Microsoft's Windows 95.

You'll also find Internet Explorer, Channels and the Active Desktop on that computer — whether you want them or not. Most of you spend an inordinate amount of time removing them from the computers you give to your users. But even if you buy from the largest computer manufacturers, such as Compaq or Dell, you cannot specify a Windows 95 OS without the clutter and claptrap that are turning your desktops into so many televisions complete with 24-hour-per-day advertising.

You can't get what you want because Microsoft won't let you. Microsoft won't let Compaq or Dell or even Pete's PC and Storm Door Company install Windows 95 without Internet Explorer and its baggage. When you can't get what you want because the world's biggest computer makers are powerless to give it to you, then it's time for government action.

At first my thoughts on the Department of Justice vs. Microsoft were guided by the principle of least government. But the sheer arrogance of Microsoft in the face of Judge Thomas Penfield Jackson's order to remove Internet Explorer from the license agreements it has with computer manufacturers gave me pause. When Microsoft stated the only way it could comply with the court order would be to give manufacturers the choice between Windows 95 with Internet Explorer and Windows 95 that would not boot, it showed a contempt for the court and the law far greater than Al Capone ever had.

I knew Microsoft had no concern for my opinion as a consumer. I suspected the company had little concern for the needs and desires of hardware manufacturers and application vendors. But to stand up and defy a federal court, to lie boldly to a federal judge, is to step over a line that should not be crossed.

Hold Microsoft in contempt, Judge Jackson. Fine the company one million dollars per day, as the Department of Justice requests. Even put the officers of the corporation in jail until they are ready to submit to the law of the land. Heed the words of our third U.S. president, who wrote: "I hope we shall . . . crush in its birth the aristocracy of our moneyed corporations which dare already to challenge our government to a trial of strength and bid defiance to the laws of our country."

Kearns scrutinizes Microsoft weekly in Network World*'s Wired Windows column. Like-minded citizens (and the dastardly few who disagree) can e-mail their comments to wired@vquill.com.*

Air your views on this issue in our online forum. Gibbs and Kearns will be monitoring the discussion until Feb. 6, so log on for some electronic back and forth.

FIND IT ON FUSION 5511

EDITORIAL *insights*

What Netscape can learn from Lotus

In an interview last week, Lotus CEO Jeff Papows had nary a negative word to say about Bill Gates. There was Papows, in the corner office long occupied by his Gates-baiting predecessor Jim Manzi, talking about his efforts to tone down the anti-Microsoft rhetoric coming out of Lotus.

Papows has tried to open a channel of communication to Gates and build stronger development ties with Microsoft. He couldn't be coaxed into blasting Gates when the discussion came around to the Department of Justice/Microsoft feud.

Has Lotus gone soft? Is this appeasement?

Hardly. Papows is a shrewd businessman who saw that Manzi's Microsoft bashing focused the world's attention on Lotus' weaknesses, rather than its strengths. In its high-profile spitting contest with Microsoft, Lotus was reminding the world again and again that it had lost the office suite fight. All its carping couldn't win back the ground lost when Microsoft changed the rules for desktop applications.

Lotus should have been focusing its attention on Notes, a cross-platform wonder-application that Microsoft still hasn't matched. Papows is determined not to repeat the mistake. Lotus is centered on providing the best groupware/messaging and Web server (Domino) platforms for Microsoft operating systems and all the other platforms out there.

The message is simple: Lotus has the enterprise applications that can integrate your systems. Microsoft can't say that. As a result, Notes and Domino sales are exploding. According to Papows, Lotus shipped 10.5 million Notes seats in 1997, doubling the user base in a single year. Domino server sales were up more than 260%.

All of this is a good lesson for Jim Barksdale and Netscape. While the Internet Explorer imbroglio has rallied the anti-Microsoft forces, it has the very unfortunate effect of confirming something Netscape wants to escape — the perception that it is just a browser company.

Barksdale wants you to think of Netscape as an enterprise intranet leader. But the company is spending so much time fighting over the browser market, which it couldn't possibly have held on to forever, that the enterprise message can't get through.

The browser market certainly is important for Netscape. But that market already has been redefined by Microsoft's tactics. Netscape needs to focus on the enterprise and its unique advantages there (does cross-platform ring a bell?) if it stands any chance of making real inroads.

If Netscape doesn't want to learn from Lotus, it ought to consider Novell. A former captain there also directed his forces against Microsoft's shock troops. Whether Novell will recover is still an open question.

John Gallant, editor in chief jgallant@nww.com

Totally Unplugged • Ira Brodsky

Federal government should practice what it preaches

If you believe Microsoft engages in anticompetitive practices, you can stop buying its products. But what can you do about a federal government that hands out favors to the well-connected?

Last year, the Federal Communications Commission gave former AT&T executive Alex Mandl's new firm, Teligent, a nationwide license for 400 MHz of spectrum in the 24-GHz band — a huge tract the rest of us didn't even know was available. Instead of following standard procedure, inviting and considering comments from the public about what to do with the suddenly discovered 400 MHz, the FCC simply gave it to Teligent. When asked why no discussion was permitted, the commission cited "national security concerns."

How well-connected is Alex Mandl? Personal communications services (PCS) operators paid more than $20 billion for 90 MHz of spectrum. Teligent obtained more than four times that amount for free.

Of course, there's more to the story. It all started when Teligent quietly acquired 100-MHz licenses in the 18-GHz Digital Electronic Messaging Service (DEMS) band. Nobody — not even outgoing FCC Chairman Reed Hundt — seems to know what DEMS is, and some have questioned the legality of Teligent's original licenses. In any event, the government feared Teligent might interfere with top-secret satellite receivers in Denver and Washington, D.C.

It appears there was a legitimate national security reason for removing Teligent from the 18-GHz band in two cities without public discussion. But there does not appear to have been a national security reason for bypassing public discussion about whether it was appropriate to compensate Teligent for the loss of 100 MHz in two cities by giving it 400 MHz in every city.

Besides, according to Bennett Kobb, author of *Spectrum Guide*, a handbook to commercial, governmental and scientific uses of the radio spectrum, the government for years insisted it didn't have any broad stretches of spectrum that could possibly be transferred to the private sector.

Whereas the FCC gave away spectrum to Teligent, it is busy making others pay through the nose. At a recent conference on upcoming Local Multipoint Distribution Service auctions, FCC officials warned attendees that there would be no license giveaways. Apparently, those are strictly reserved for Teligent.

The FCC also has decided to punish winners of C-block PCS auctions. The C block was supposed to facilitate the entry of new players into the capital-intensive wireless telephone service business. But it was ill conceived: Favorable payment terms were outweighed by a series of delays, giving cash-rich A- and B-block licensees a substantial time-to-market advantage.

According to a popular theory, a few reckless bidders drove everyone else out of the C-block auction. It would be unfair to the losers to now reward those who bid too much by further relaxing payment terms. However, virtually all C-block auction participants based their bids on the estimated value of licenses that were supposed to guarantee them a competitive advantage. Subsequent FCC actions actually contributed to a reduction in the perceived value of those licenses.

While the FCC is giving Teligent 400 MHz of spectrum gratis, it's trying to make the rest of the wireless industry pay twice for 30 MHz in the PCS band. The FCC has asked cash-strapped C-block auction winners to give back the licenses they hold in certain cities — forfeiting a big chunk of what they've already paid — and plans to reauction the returned spectrum. This despite the fact that C-block license holders already have paid the government more than a billion dollars.

So here's my advice to the federal government on what to do about anticompetitive and unfair practices: Heal thyself.

Brodsky is president of Datacomm Research Co., a consulting firm in Chesterfield, Mo. He can be reached at ibrodsky@ix.netcom.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Seek alternate routes

Regarding your editorial "Are you hypocrite?" (Dec. 22, 1997, page 24), in which you suggest that those who ar unhappy with Microsoft buy from its competitors:

Let's all start using inferior product out on the market — especially those from companies that do nothing but cry about how big, bad Microsoft is hurting them when they should be paying more attention to putting out a better product.

I think it is up to Microsoft to determine what it wants to include with Windows 95/98. Everyone knows that the Internet has become a critical part of

Infrastructure Insights • Mary Petrosky

Consolidation breeds interesting times

The Chinese proverb "May you live in interesting times," which can be both a blessing and a curse, certainly describes life in the networking industry. For example, industry consolidation continues even as new companies spring up. The pace of change poses serious challenges for vendors and IT managers who must navigate the shifting landscape.

Several forces are driving consolidation of all types. As the Internet has taken off, we've seen a consolidation around a few core technologies, including IP and switching. Consequently, the boundaries between LANs and WANs are blurring. Similarly, technologies for combining data and voice traffic on the same network have emerged, prompting the traditional data networking vendors to cast a covetous eye on the telephony market, and vice versa.

Overall, technology consolidation is good for IT organizations in that it narrows the technical choices you have to make, while broadening the number of vendors from which you can buy that technology. And there's no doubt that the heated competitive environment is driving solutions to market more quickly. Consider, for example, the rapid pace of development of Gigabit Ethernet and High-Speed Token ring.

However, technology and market consolidation also can lead to customer lock-in. Building an infrastructure that has equivalent, if not identical, services across the LAN and WAN is no mean feat. Single-vendor solutions may be the only way to get certain advanced capabilities, such as end-to-end policy-based security or quality of service. Vendors are driven to grow larger so they can offer customers as many technology pieces as possible.

A quick look at some of the events of 1997 leaves no doubt that market consolidation will continue for the foreseeable future. The merger of 3Com and U.S. Robotics, for example, created a company large enough to be Cisco's rival, at least in terms of revenue. The merger also stratified the traditional data networking vendors into two distinct classes: those with more than $5 billion in sales (Cisco and 3Com) and those with less (Bay and Cabletron, in particular).

Cabletron, knowing it must leap to the next level or be left behind, last year made a number of radical changes. Perhaps the most significant was the retirement of founder Bob Levine and appointment of Don Reed as new president and CEO. Reed is a telephony veteran — having spent the past 20 years at NYNEX and New England Telephone — and brings a very different perspective to Cabletron.

For example, Reed has made it clear that Cabletron will grow, in part, through acquisitions. In acquiring Digital's Network Product Business unit, Reed simultaneously took out a player while expanding Cabletron's international sales and support organization and gaining products that appeal to service providers. Likewise, by acquiring YAGO Systems, Cabletron has made a bold move to gain routing expertise and a high-speed Layer 3 platform. It's too early to tell whether Cabletron will succeed in radically transforming itself, though this will be a telling year.

Cisco, for its part, did its usual half-dozen acquisitions, mostly of smaller companies for a few hundred million dollars' worth of stock here and there. Importantly, five of the six companies brought Cisco some form of voice or WAN technology. Most recently, Cisco bought LightSpeed to exploit the transition of voice traffic away from purely circuit-switched networks to integrated circuit- and packet- (or cell-) switched nets.

Similarly, Cisco's acquisitions of Dagaz Technologies, Ardent Communications, Skystone Systems and Telesend brought the company digital subscriber line products; technology for compressed voice, LAN, data and video traffic; high-speed Synchronous Optical Network (SONET)/synchronous digital hierarchy technology; and WAN access products, respectively.

Earlier this decade, Cisco bought its way to dominance in the switching market. Now Cisco is buying its way into the WAN and telephony markets. Although it has made inroads in these arenas, Cisco's success is not assured. On its present course, Cisco eventually will encounter Lucent Technologies.

At more than $25 billion in revenue, Lucent is no lightweight. Whereas Cisco is trying to "grow up" from its enterprise/data orientation to a global/telephony perspective, Lucent is trying to reach down into the enterprise, most recently through its acquisition of Gigabit Ethernet start-up Prominet. Arguably, Lucent has the easier job; it's easier to scale down systems and management than to scale them up.

And Lucent has some heavyweight tools in its bag, including its Internet Directory Server (IDS), a directory service that Lucent claims can handle more than 20 million entries. Cisco, for its part, is waiting for Microsoft to deliver Active Directory —which, according to recent reports, can accommodate roughly 10 million entries, only half of IDS' purported capacity.

IT managers need to focus on what vendors are and not be blinded by what they want to become. Each vendor has core strengths around which it has added other things. If what you need isn't a given vendor's core strength, but you like the other things you see, be sure to test the products you need before you make a strategic commitment. Otherwise, you will find yourself living in very interesting times.

Petrosky is a senior analyst with The Burton Group, an information services firm that provides in-depth technology analysis. She can be reached in her San Mateo, Calif., office at (415) 572-0560 or at petrosky@tbg.com.

our everyday computer use, so does it not seem logical that better integration with the OS is a good thing?

I believe Microsoft will prevail, if not with the government then with the consumers who aren't afraid to use products from a company that only wants to continue to improve its product line.

John Lundell
St. Paul, Minn.

Your editorial "Are you a hypocrite?" is right on target.

I enjoy using Microsoft products as I find them easy to use, and they meet my needs consistently. I admire Bill Gates for his success in the marketplace. I believe those who cry foul the loudest are those who are unwilling to compete.

Bundling is a common practice in the software industry. If Microsoft is required to unbundle Internet Explorer from Windows, then all software producers should have to unbundle their products.

Edward Sujdak
Business continuity coordinator
Barnett Banks, Inc.
Jacksonville, Fla.

Your Dec. 22 editorial misses an important aspect of the current criticism of (and Justice Department suit against) Microsoft.

Consumers should not be expected to go against their own best interests to protest or resist the marketing policies of a monopolist. If Microsoft unfairly leverages its dominance of desktop operating systems to crush its competitors, that does not mean that its products may not be the best choice for certain buyers.

It is certainly true that there are alternatives to almost everything Microsoft makes, but as your own publication has mentioned, many developers of personal software limit themselves to areas Microsoft isn't interested in or that Microsoft might be interested in buying up.

Inevitably, choices are more limited and real breakthroughs take longer than if the market were more open.

I support the attempts to bring Microsoft's practices into compliance with the law because I want the company to flourish based on excellence, not arm-twisting.

Tyler Page
Network administrator
Trojan Lithograph
Kent, Wash.

Your editorial hit the nail on the head. It was refreshing to see the press demonstrate that there is no Microsoft monopoly as long as there are viable, and often free, alternatives.

Charles Evans
President and chief knowledge officer
Chyden.Net
Fairfax, Va.

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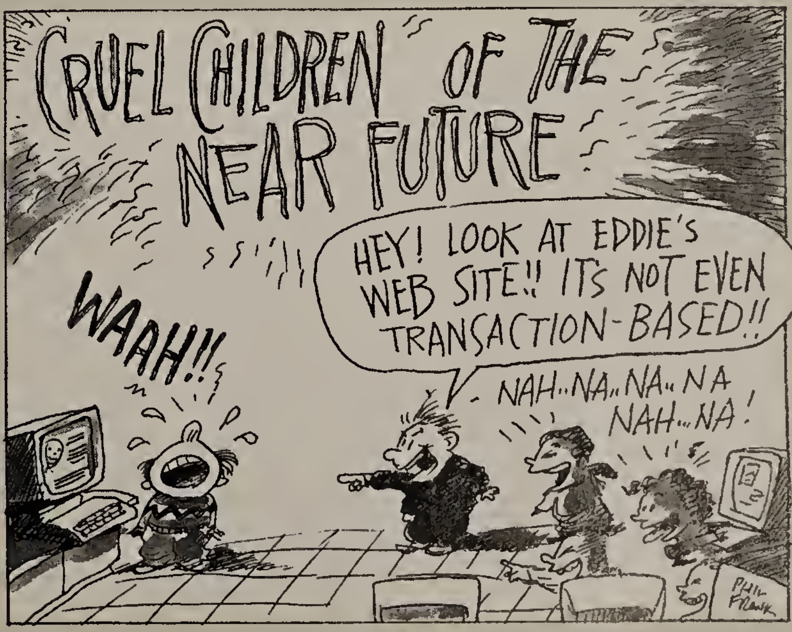
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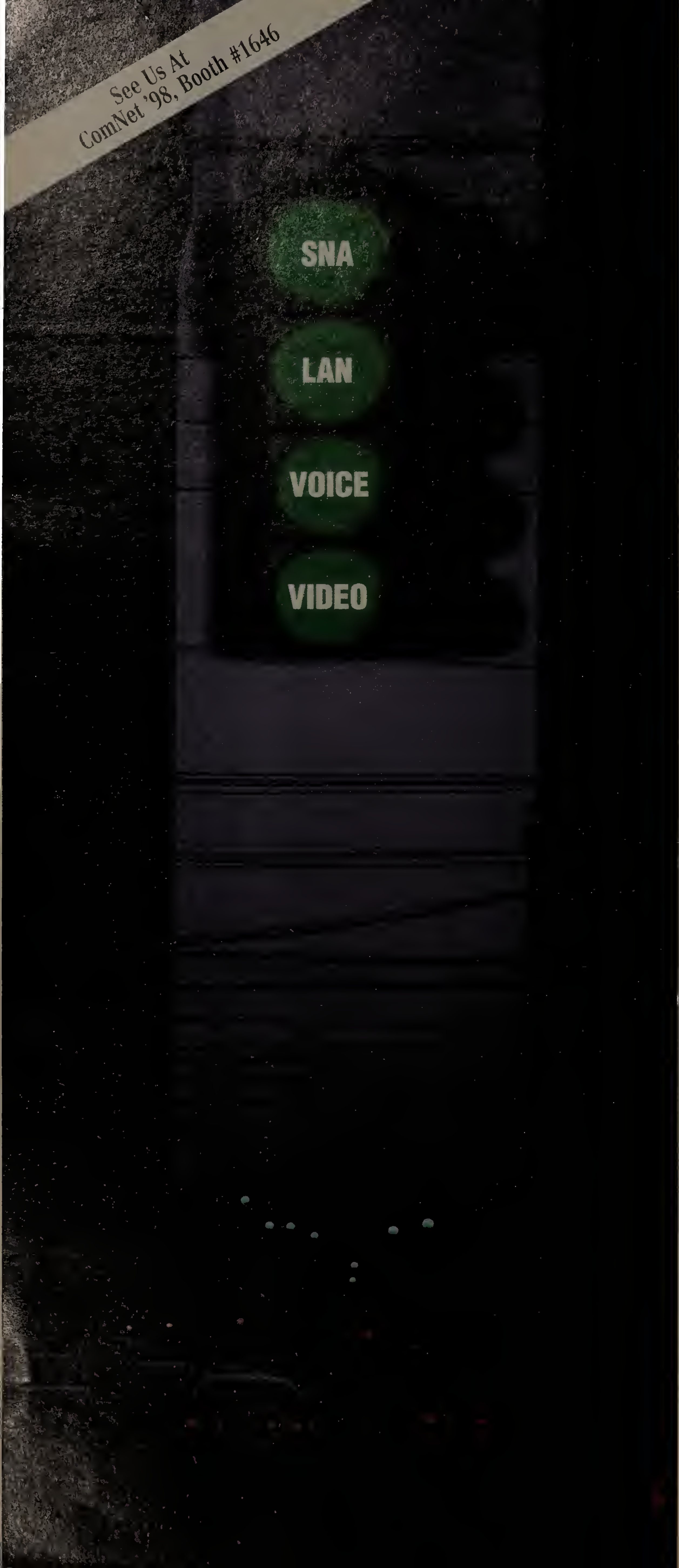

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Directing traffic on the wide area network used to be simple: SNA always had the right-of-way. But now, thanks to Frame Relay and ATM, voice and video applications can share the WAN with legacy and LAN data. The trick is to give them all the right-of-way when they need it.

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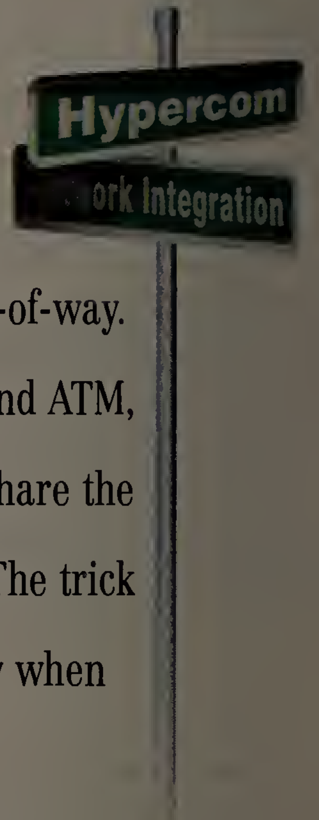


BUYER'S GUIDE

GIGABIT ETHERNET

BACKBONE SWITCHES

Gigabit Ethernet is good to go

Extreme leads the pack of solid and speedy backbone switches that are ready to boost your LAN's bandwidth.

Gigabit Ethernet's speed is calling to you. You've just got to be the first on your block to own one of these screaming switches.

The trouble with being an early adopter is there are few folks who can give you buying advice. Before you listen to some glitzy sales pitch, consult this Buyer's Guide on Gigabit Ethernet Backbone Switches.

We defined backbone switches as those supporting at least four Gigabit Ethernet ports and invited all vendors meeting the criteria to submit their products for testing. The Review below shows how the four that accepted the challenge stack up. True to its name, Extreme Networks' Summit1 garnered our Blue Ribbon for being the pinnacle of performance. Prominet Corp.'s solid P550 Cajun Switch came in a close second.

But there's more to consider than performance. As our Issues and Trends story on page 50 reports, you'll need to scrutinize the specifications of the switch architecture and learn which features are standard — we'll clue you in on the most important ones to look for. The Buyer's Guide Chart on page 51 gives you an overview of 12 Gigabit Ethernet backbone switches that are available now or will be ready to go by the end of the quarter.

By Edwin Mier, Robert Smithers and Thomas Scavo

REVIEW

Remember when Fast Ethernet first strolled into your office? It quickly found a comfortable home on your net. But that was many years and many nodes ago. Now Gigabit Ethernet has arrived, whispering the same seductive promises. Should you believe it?

Surprisingly, yes. Our tests showed Gigabit Ethernet is capable of supporting much higher volumes of traffic than most of today's networks. And thanks to vendor adherence to standards, we found good interoperability among products.

Two of the switches we examined led the pack — the eight-Gigabit port, stackable Summit1 switch from Extreme Networks, and the seven-slot, modular P550 Cajun Switch from Prominet Corp., which is expandable to 12 gigabit ports. These are both solid, stable products that can add a substantial backbone bandwidth boost to any 10/100Base-T switched network.

Foundry Networks, Inc.'s four- to six-Gigabit port TurboIron Switch also turned out to be a solid and stable switch, but at the lower end of the performance and throughput scale.

Bay Networks, Inc.'s eight-slot, modular Accelar 1200 Routing Switch, the first product from Bay's acquisition of Rapid City Communications last June, exhibited numerous problems. However, we were able to test only a late beta version of the switch — it was not scheduled to begin shipping until this month.

Still, Bay gets credit for showing up. A number of vendors that claimed to be shipping Gigabit Ethernet switches by the end of last year were invited to participate, but declined. In many cases, we learned that these products either were not yet shipping, despite vendor claims to the contrary, or were still in beta testing and were not ready for an independent evaluation. Those that declined our invitations include Acacia Networks, Inc., Gigalabs, Inc., NBase Communications, Packet Engines, Inc., Plaintree Systems, Inc., XLNT, Inc. and YAGO Systems, Inc.

With so many vendors rushing to play in this market, you might wonder if any have cut corners. Our testing showed Gigabit Ethernet products interoperate adequately. And some switching products available now are delivering unprecedented, and indeed incredible, switching capacities.

Standards stand up

Gigabit Ethernet standards are most settled and stable at the physical layer. The universal Gigabit Ethernet physical interface, and the common denominator of all the switches tested, is 1000Base-SX, running in full-duplex mode. Some features involving higher layer functionality — such as autonegotiation and a new form of flow control using explicit "pause" packets — are still not implemented consistently or fully by all vendors.

Still, those issues didn't affect our ability to get everything connected and working together. All of the switches we tested worked compatibly with at least two other vendors' 1000Base-SX interfaces. They could exchange data, ranging from minimum to maximum packet sizes, at the full 1G-bit/sec rate in both directions across a multimode-fiber patch cable with dual-SC connectors

Score Card

NetworkWorld Blue Ribbon	Performance (30%)	Configuration (30%)	Features (20%)	Management and administration (20%)	Overall score
Summit1	9 x .30 = 2.7	8 x .30 = 2.4	8 x .20 = 1.6	7 x .20 = 1.4	8.1
P550 Cajun Switch	9 x .30 = 2.7	9 x .30 = 2.7	7 x .20 = 1.4	5 x .20 = 1.0	7.8
TurboIron Switch	7 x .30 = 2.1	6 x .30 = 1.8	8 x .20 = 1.6	9 x .20 = 1.8	7.3

Note: Because Bay's Accelar 1200 Routing Switch still was in beta during testing, we did not publish ratings for it.
Individual category scores are based on a scale of 1–10. **Percentages** are the weight given each category in determining the total score.

at each end.

We also found good interoperability between network interface cards (NIC) and switches from different vendors. Packet Engines' 1000Base-SX NICs, also running in full-duplex mode, worked with each of the switches tested with no problems.

We even tried piecing together a series of multimode-fiber patch cables — a total of six 50-foot cables, concatenated with ST connectors — to see if that would make a difference. We wondered if the distance or the slight differences in different cable manufacturers' tolerances might cause problems at gigabit rates.

They didn't. Every packet sent at up to 1G bit/sec arrived intact.

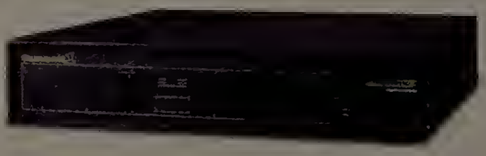
Extreme-ly impressive

Our top performer was Extreme's Summit1 fixed-configuration switch, with six 1000Base-SX ports and two single-port option slots. The options can be one or two more 1000Base-SX ports, or one or two 1000Base-LX ports, for a maximum switch total of eight. 1000Base-LX, the second quickly emerging Gigabit Ethernet interface, is a long-wavelength laser-based interface that extends Gigabit Ethernet links up to several miles over single-mode fiber. Extreme claims to have tested its 1000Base-LX interface for distances of up to 10 km.

There's no 10/100Base-T support with the Summit1, however, and that's an annoyance. You need one of Extreme's Summit2 switches to connect via a 10/100 port. Without 10/100Base-T support, an administrator, who's typically equipped with a laptop and a 10/100 network interface, can't readily access the switch for in-band SNMP management.

But this shortcoming, and the absence of support for port mirroring, are really the only two notable laments with Extreme's switch. Most everything else was done impressively.

From a performance perspective, everything with the Summit1 switch works as expected. Switching four 1G-bit/sec packet streams through the Summit1 posed no problems. It seems likely that the switch's 17.5G-bit/sec backplane should handily accommodate all eight Gigabit Ethernet ports (for as much as 8G bit/sec of load) without strain.



Extreme's Summit1 *captured our Blue Ribbon for its top performance.*

Indeed, it would seem that even if the number of Gigabit ports were doubled, most of the full-rate load probably still could be accommodated across this switch's backplane.

Besides rock-solid performance, other notable pluses with the switch include an impressive multilink load-sharing capability. This enables you to pass loads of multiple gigabits per second between two switches, bidirectionally and concurrently, over multiple, load-shared and fault-tolerant links. It also offers a switching-table capacity of up to 128,000 media access control (MAC) addresses, which is an order of magnitude more than many high-end 10/100-Base-T switches. For large networks, this keeps known nodes from being dropped from the switch's memory on an oldest-first basis.

We tested Extreme's multilink load-sharing and failover capability, which enables up to four ports to be aggregated as a logical group, allowing 4G bit/sec of data traffic to be blasted between two switches. As with everything else with this switch, it worked impressively. If one of the links went down, its traffic was rerouted almost instantaneously to the other links in the group.

Extreme uses a proprietary protocol to implement load sharing and failover, as do Foundry and Prominet for equivalent load-sharing features they support. Bay doesn't yet support load sharing over multiple links.

The Extreme switch's considerable MAC-address capacity is diminished by half when IP routing is running. The same generally is true for other Gigabit Ethernet switches that also can do routing. This trade-off is understandable because some part of the memory allocated to the switching MAC-address table is then typically put to use storing IP routes.

Prominet: The strong, silent type

Prominet's P550 Cajun Switch is based on a 13-by-13 crosspoint-matrix structure, a connection-oriented design not unlike most ATM switches. This is fairly different from most Gigabit Ethernet switches, which employ an architecture called shared memory. But like some other Gigabit switches, including Foundry's, Prominet's is bidirection-

Standards not set yet

The ink on Gigabit Ethernet standards is still wet. Indeed, most of what has been settled on within the IEEE's 802.3z subcommittee won't be officially adopted and formally finalized for a few more months.

Some aspects of Gigabit Ethernet, such as how to run it over unshielded twisted pair (UTP) copper cabling instead of optical fiber, have been spun off into separate standards groups, so as not to delay the introduction and rollout of fiber-based Gigabit Ethernet products. A separate IEEE subcommittee, 802.3ab, now is busily figuring out how to do Gigabit Ethernet over UTP. Most agree that users won't see this in any sort of final form for at least a year.

Net Results

	Summit1	**P550 Cajun Switch**	**TurboIron Switch**	**Accelar 1200 Routing Switch**
	Extreme Networks *(408) 342-0999* *www.extremenetworks.com* *$25,000; 8 ports ($3,130 per port)*	*Prominet Corp.* *(508) 303-8885* *www.prominet.com/product/product.htm* *$29,750; 8 ports ($3,719 per port)*	*Foundry Networks, Inc.* *(888) 887-2652; (408) 731-3800* *www.foundrynet.com/tigigswitch.html* *$15,990; 6 ports ($2,665 per port)*	*Bay Networks, Inc.* *(408) 988-2400* *www.baynetworks.com/Products/nav/f_accelar_12_routing_sw.html* *$34,990; 6 ports ($5,832 per port)*
PROS	▲ Includes high-capacity IP routing ▲ Supports 1000Base-LX (1 or 2 optional ports per switch) ▲ Excellent performance ▲ Four-level prioritization expedites real-time and time-sensitive traffic ▲ As many as 128,000 MAC addresses supported	▲ Gigabit Ethernet and 10/100Base-T supported in same switch ▲ Modular flexibility ▲ Excellent performance ▲ Impressive backplane bandwidth for growth, scalability ▲ User can allocate bandwidth by traffic type	▲ IP and IPX routing (via optional $4,000 software) ▲ Supports 1000Base-LX ▲ Excellent NT-based management software ▲ "Lock address" feature lets user constrain port access to specific MAC addresses (up to 1,000); good for security	▲ Gigabit Ethernet and 10/100Base-T supported in same switch ▲ Modular flexibility ▲ Includes high-capacity IP routing
CONS	▼ No gigabit flow control (planned) ▼ No port mirroring ▼ No Ethernet port on switch for management access	▼ No routing (planned) ▼ No port mirroring ▼ VLAN functionality is limited (port groupings only) ▼ Web management interface leaves much to be desired	▼ Limited switching bandwidth (less than 3G bit/sec) ▼ No Ethernet port on switch for management access	▼ Beta bugs (problems with Spanning Tree Protocol, VLAN setup, broadcast traffic handling, and others) ▼ Some loss with streams of large packets (1,518 bytes) ▼ No built-in Ethernet port for management access ($10,000 16-port 10/100 module required; takes up a slot) ▼ No multilink load-sharing

320 Mbps for $2.75 per port.

Bob was never good at decimals, but he did find a great deal.

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How we did it

Our methodology called for four concurrent 1G-bit/sec packet streams to be delivered to each switch, as part of a media access control-layer switching load test. The streams, consisting of three background streams of 1,518-byte packets and a test stream of 64-byte packets, were generated by a NetCom Systems, Inc. SmartBits analyzer equipped with Gigabit GX-1405 modules.

Next, we tested switches for interoperability. We installed off-the-shelf 1000Base-SX gigabit network interface cards (NIC) from Packet Engines, Inc. in Digital Equipment Corp. Alpha-based clones made by Carrera Computers, Inc. Using these systems and NICs running Windows NT 4.0 and various public-domain software tools, we generated unidirectional IP traffic streams exceeding 400M bit/sec. By specially configuring the NICs to generate packets in their onboard memory, we could generate an IP stream of maximum-sized packets at full gigabit line rate.

We checked the switches for head-of-line blocking by first delivering a single packet stream of 700M bit/sec. This stream was switched to two output ports – 600M bit/sec to an output Port A and 100M bit/sec to an output Port B. We then sent a second 600M bit/sec load to the switch's output Port A, resulting in a 20% overload on that port. We then monitored Port B to see if the overload on Port A adversely affected output on Port B.

We used NetCom's SmartBits analyzer to generate traffic and monitor results for the head-of-line blocking test, and checked our results with a beta release of Hewlett-Packard Co.'s new HP Internet Advisor for Gigabit Ethernet.

al in nature: The total 45.8G bit/sec of backplane bandwidth represents 1.76G bit/sec of bandwidth for each of the 13 paths of the crosspoint matrix, times two for both directions.

Whatever happens inside the P550 Cajun Switch, it definitely works. We experienced no hint of any problems with the mixed-packet-size load of four 1G-bit/sec traffic streams we delivered to the switch.

As with Bay's switch, the Prominet P550 Cajun Switch is based on a modular chassis with seven slots. We were happy to find a 10/100 port built into the control module that plugs into the first slot. There can be a second, redundant control module, or all six remaining slots can be used for interface modules — including a 20-port 10/100Base-T module.

Prominet's P550 Cajun Switch *was a great performer and supports as many as 12 gigabit ports along with 10/100Base-T.*

A lot of desirable options still weren't available for the switch when we tested it in November. But some key ones — including 1000Base-LX support, IP routing and higher density, four-port Gigabit Ethernet modules (yielding a 24-gigabit-port switch capacity) — were expected to be delivered this month.

One flaw in Prominet's execution is its management software. The console's command-line interface is limited — you can't use it to retrieve any statistics, for example. And we found the main management interface, which is based on any frames-capable Web browser, to be kind of cheesy. We could not, for example, zero the statistics counters — this only can be done by cycling power to the switch — and statistics viewed through the Web browser aren't updated in real time.

The fact that some features weren't yet available and a less-than-optimal management interface don't detract too much from this switch, however. It's rock solid and an excellent performer. And a number of features that now are supported, such as its unique ability to let you tune the switch by allocating percentages of bandwidth to specific priorities and traffic types, are impressive. The fact that late last year Prominet was acquired by Lucent Technologies, Inc. also lends stability to this start-up vendor.

Foundry: A bit short on bandwidth

Foundry's TurboIron Switch does not have quite enough internal bandwidth to handle its ports running at the full 1G-bit/sec rate. There are four Gigabit Ethernet ports in the base TurboIron Switch, along with option slots for two more. And, as with Extreme, Foundry also now supports 1000Base-LX; the base, four-port TurboIron Switch can be all SX or LX, as can the optional ports.

However, the total sustained switching throughput the TurboIron can handle is not quite 3G bit/sec, somewhat less than the switch's 4.2G-bit/sec backplane bandwidth. This is a problem because even in the switch's minimal configuration, as much as 4G bit/sec of packet traffic load could arrive at once via the system's four full-duplex gigabit ports. We clocked the switch's maximum throughput at about 2.9G bit/sec, with all traffic consisting of minimum-sized, 64-byte packets.

Foundry's TurboIron Switch *showed traffic bottlenecks across its internal backplane, but came with the best management software of the switches we tested.*

The throughput limit of Foundry's TurboIron Switch was our major concern. Another one, small by comparison, was that 10/100Base-T isn't supported anywhere in the switch. As with Extreme's Summit1, you need another switch supporting 10/100 ports and a gigabit uplink to gain in-band management access to the switch.

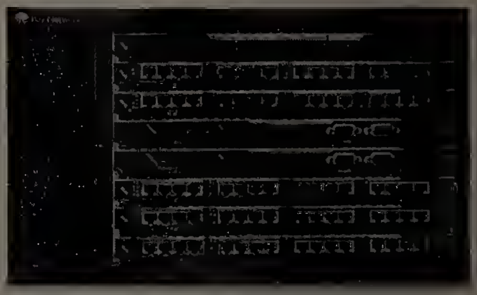
Foundry reportedly supports IP and IPX routing on the TurboIron Switch. However, to tap this capability you must load separate, extra-priced, operating software for the switch. The TurboIron Switches that Foundry sent us had only the base switching software loaded.

The good news for Foundry, though, is that we consider this switch's management the best of all the switches we tested. The vendor's IronView software (Version 2.0), which runs only on Windows NT, provides intuitive, graphical management of the switch. Even virtual LAN setup and management is simple and fast.

Beta bugs bite Bay

Bay's Accelar 1200 Routing Switch held up well for scalability, capacity and supported Gigabit Ethernet options. A major plus is that the switch accommodates 16-port 10/100Base-T modules, in addition to two-port Gigabit Ethernet modules, all within the same switching system. It would have been nice, however, if Bay had put at least one 10/100 port on its control module or somewhere in its switch chassis.

The Accelar 1200 is an eight-slot chassis, which, with one or dual redundant control modules, leaves six slots for interface modules. The system wields a rated backplane switching capacity of 7.5G bit/sec in each direction, for a total of 15G bit/sec.



Bay's Accelar 1200 Routing Switch *was still in beta when we tested it. Bay expected to ship the product by the end of this month.*

The Bay switch handled the four concurrent gigabit traffic streams we delivered to it. However, we noticed some loss with 1G-bit/sec traffic streams consisting of all large packets (1,518 bytes), on the order of about 2% of all packets.

We found, too, that broadcast packets would not be propagated properly by the switch if they came in at a high rate. When a stream of broadcast packets was delivered on one port at the full gigabit rate, only about half of these were retransmitted out on the

GIGABIT ETHERNET SWITCH PERFORMANCE

	Summit1	P550 Cajun Switch	TurboIron Switch	Accelar 1200 Routing Switch
Latency for a 64-byte packet passing through switch (FIFO method):				
• With no load on switch	5.8 microsec	3.8 microsec	16.1 microsec	5.2 microsec
• With 2G bit/sec load on switch	5.7 microsec	3.8 microsec	16.6 microsec	5.3 microsec
• Latency variability (jitter)	Less than 1 microsec	None	Less than 2 microsec	Less than 1 microsec
Switches four full-rate Gigabit Ethernet input streams (mix of minimum- and maximum-size packets; all unicast) with no packet loss	Yes	Yes	No (maximum switched throughput is between 2G and 3G bit/sec; 2.9G bit/sec throughput measured with all 64-byte packets)	Not quite; some slight loss (about 2%) occurred for streams of maximum-size (1,518-byte) packets
Failover time to redundant, parallel switch-to-switch link, using Spanning Tree Protocol	49 sec	48 sec	47 sec	Failover unsuccessful; problems experienced with Spanning Tree Protocol-based switchover
Failover time with load-shared, parallel switch-to-switch links, using vendor's proprietary trunk-grouping protocol	Less than 1 sec	Less than 1 sec	Less than 1 sec	Load-shared links not supported; hot-standby links fail over in less than 1 sec

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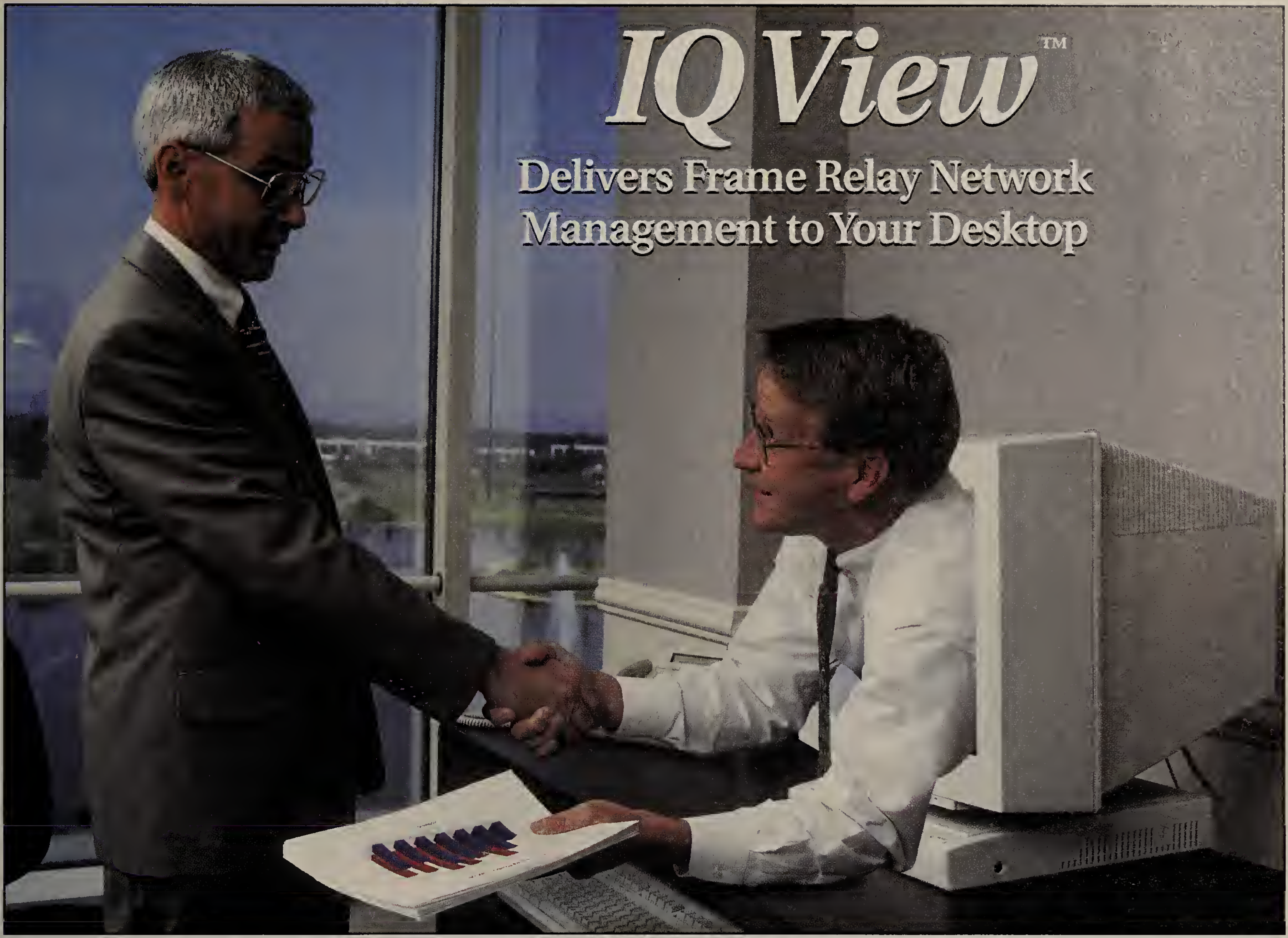
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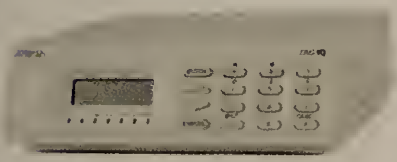

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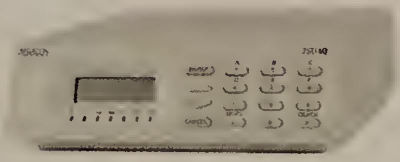

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switch's other ports. Bay claimed these were known problems with the beta software that would be fixed before final release.

Another major problem we encountered was with the Bay switch's Spanning Tree Protocol implementation. Increasingly, switches rely on Spanning Tree to prevent redundant data paths, or loops, from causing network crashes. Also, Spanning Tree provides a reliable, standard mechanism for automatically switching over from a primary path to a redundant path, if the primary path should go down. But Spanning Tree wasn't working right on the Bay switch, a problem the vendor acknowledged and said it was working on.

Bay offers a new Windows-based AccelarView package for managing this Gigabit Ethernet switch. It consists of separate Device Manager and VLAN Manager applications. We tested late beta Version 0.67.

As with the switch, we ran into a few problems with the management software. The graphical representation of the switch is super, and details are easily obtained by clicking on the switch part, or port, of interest. However, we couldn't get two key functions to work properly: the trap log part of Device Manager and the VLAN Manager.

Bay's Accelar 1200 has a lot of the makings of what could be a great switch. The price is disproportionately high, though, and Bay still needs to work out a few problems in the beta cycle before final release.

Wrapping up

Based on our tests of these four switches, we're happy to say Gigabit Ethernet works. While initial switch prices are still high, Gigabit Ethernet now represents one technological solution for high-speed backbones where 100M bit/sec is not enough.

Prominet's P550 Cajun Switch and Extreme's Summit1 switch led this pack. The Summit1, mainly because of its superior management software, edges out the competition and emerges as the Gigabit Ethernet switch to beat.

Mier is founder and president of Mier Communications, Inc., a network consultancy and product test center based in Princeton Junction, N.J. In addition to public and private product testing and competitive analysis, the company also publishes special reports, including "The Switch Book," an annually updated compendium and comparison of LAN switches and analysis of switching technology and market trends. Smithers is manager of lab testing, and Scavo is a systems integration specialist at Mier Communications. They can be reached by phone at (609) 275-7311, or via e-mail at ed, rob or tom@mier.com.

How to play for keeps

Tips for sizing up and choosing a Gigabit Ethernet backbone switch you'll want to grow old with.

By Edwin Mier

ISSUES AND TRENDS

Just as you're settling into a comfortable relationship with Fast Ethernet, Gigabit Ethernet sidles up to you. Gigabit Ethernet makes an attractive and reliable mate for your backbone, but be sure to take the time to really get to know a switch before choosing it as your long-term partner.

Although the ink on the relevant IEEE Gigabit Ethernet specifications is still drying, the switches are good to go. At last count, more than a dozen vendors were already shipping, or expected to soon begin shipping, Gigabit Ethernet backbone switches.

As lingering concerns about Gigabit Ethernet performance and interoperability evaporate, so do the risks associated with buying into the technology. And there's more good news — per-port prices for Gigabit Ethernet switches are poised to drop dramatically in response to growing supply and demand.

The downside is that Gigabit Ethernet switch vendors are churning out more marketing bravado and dubious one-up specmanship, making it difficult for you to pinpoint which product best meets your needs. Be sure to ask vendors for independent verification of switch performance and throughput.

You also should reserve some skepticism for product availability claims. Several vendors featured in the Buyer's Guide chart still were completing final testing on their switches at press time. If you suspect availability problems, don't hesitate to ask the vendor for customer references and check them.

If the products are ready and waiting, when should you buy? It largely depends on your network's requirements and budget. Keep in mind that today's first-generation Gigabit Ethernet switches are still fairly expensive at $2,000 to $3,000 per port.

Naturally, you'll get a better per-port cost the longer you wait. If Gigabit Ethernet prices drop the way Fast Ethernet did, you can expect Gigabit Ethernet switch ports to cost as little as $200 to $300 before the millennium. It's also reasonable to expect that any Gigabit Ethernet switch you buy six months to a year from now will support more features and options than today's models.

In addition to price, you should base your purchasing decision on these key factors: switch architecture and how it affects performance and scalability; standards support; and features such as concurrent routing, virtual LANs and trunking.

Look into backplane bandwidth

Because you'll probably deploy your first Gigabit Ethernet switch in the network backbone, the switch's backplane capacity will become the new ceiling of your network's overall bandwidth capacity, especially in a star topology. Strive to buy enough bandwidth to satisfy your requirements for the next three to five years, or the period of time over which you'll depreciate the purchase.

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- **Our assessment of how Gigabit Ethernet switches compare to ATM switches**

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When you're evaluating products, keep in mind that not all switches are created equal. Some switch architectures may prevent you from using all of the backplane bandwidth capacity.

Because Gigabit Ethernet is only deployed in full-duplex mode to date, every Gigabit Ethernet port could be delivering 1G bit/sec of traffic to the switching fabric at the same time it is receiving 1G bit/sec.

Some Gigabit Ethernet switches, such as those from Bay Networks, Inc. and Prominet Corp., have a directional aspect to them. These switches' backplane bandwidths represent the total capacity in both directions. However, you wouldn't be able to fully utilize this capacity unless traffic were moving to and from the switching fabric in equal amounts, which is an unusual occurrence.

You ideally should look for at least 1G bit/sec of backplane bandwidth for each port in the maximum available configuration. More is good because it leaves you room to grow. But if there's less, you risk losing data with a fully configured switch under continuous heavy load.

However, you also need to look beyond the surface. In the case of Extreme Networks' Summit1 switch, for example, it would appear that the maximum configuration of 32 Gigabit Ethernet ports would greatly overwhelm the 17.5G-bit/sec backplane. But the maximum configuration is based on interconnecting four eight-port switches that each have a 17.5G-bit/sec backplane. The hardware required to link the switches is scheduled to ship this quarter.

Another major difference in the high-end switches is their support

PRODUCT CHART: GIGABIT ETHERNET BACKBONE SWITCHES

Company	Product name	Ship date	Configuration					Throughput			Virtual LANs			Filtering		Trunking		Routing	Traffic priorities		Mgmt.	Cost		
			Minimum number of Gigabit Ethernet ports	Maximum number of Gigabit Ethernet ports	Maximum number of Fast Ethernet ports	Maximum number of ATM ports	Maximum number of FDDI ports	Backplane bandwidth [in G bit/sec]	Maximum switched bandwidth in bit/sec with traffic delivered at wire rate on all ports	Maximum IP switching throughput [in packet/sec, assuming 64-byte IP packets]	Port-based	MAC address-based	Layer 3 protocol-based	Filtering criteria	Filters can be applied on a per-port basis	All links in a trunk group can operate concurrently	Maximum number of ports that can be consolidated in a single trunk	Protocols other than IP can be routed	Supports multiple priorities/queues	Number of priorities/queues supported	Supports Web management [SNMP-based tools via IP address/browser]	Standard warranty in months	Management application is included in price	Price per port [fully configured with Gigabit Ethernet ports]
3Com Corp. (408) 764-5000 www.3com.com	SuperStack II Switch 9000	Nov. 1997	8	8	0	0	0	17.2	16G	11.9M	●			None			NA		●	2		12	●	$2,500
Acacia Networks, Inc. (888) 422-2242 www.acacianet.com	NovaSwitch TruStak	Sept. 1996	0	14	70	14	14	9	6.9G	5.5M	●			Port	●	●	8	●	●	8	●	36	●	$1,024
Bay Networks, Inc. (800) 822-9638 www.baynetworks.com	Accelar 1200	Jan. 1998	1	12	96	0	0	15	7.5G	7M	●		●	MAC address	●		NA		●	2	●	12	●	$2,875
Cabletron Systems, Inc. (603) 332-9400 www.cabletron.com	SmartSwitch 9000	March 1997	2	28	364	224	42	75	10G	10M	●	●	●	Protocol and MAC address	●	●	Unltd.	●	●	4		3		$4,500
Digital Equipment Corp. (800) 344-4825 www.networks.digital.com	GIGAswitch/ Ethernet system	March 1998	2	24	120	0	0	45	22G	NA	●			MAC address	●	●	Unltd.		●	2	●	12	●	$2,750
Extreme Networks, Inc. (408) 342-0999 www.extremenetworks.com	Summit1	Sept. 1997	8	32	0	0	0	17.5	64G	48M	●	●	●	MAC address,destination IP, TCP and UDP		●	4		●	4	●	12	●	$3,125
Foundry Networks, Inc. (408) 731-3800 www.foundrynet.com	TurboIron	July 1997	4	6	2	0	0	4.2	4.2G	7M	●	●	●	Protocol, IP port number, IPand IPX source and destination address, IPX SAP	●	●	4	●	●	3	●	3 for software; 2 for hardware		$2,500
NBase Communications (818) 773-0900 www.nbase.com	GigaFrame Switch #GFS 3012	Sept. 1997	4	12	64	0	0	8	8G	5.5M	●	●	●	MAC address	●	●	4	●	●	2	●	12	●	$2,549
Packet Engines, Inc. (888) 357-7496 www.packetengines.com	PE-4884 Gigabit Routing Switch	March 1998	1	25	240	48	24	52	50G	37M	●	●	●	MAC address, port address, Layer 3 [IPv4, IPv6 and IPX]	●	●	4	●	●	8	●	24	●	$3,495
Prominet Corp. (888) 303-8885 www.prominet.com	P550 Cajun Switch	Oct. 1997	2	24	120	0	0	45.8	22.9G	33M	●	●	●	MAC address, protocol, VLAN	●	●	Unltd.	●	●	2	●	12	●	$2,663
XLNT, Inc. (800) 818-9568 www.xlnt.com	Millennium 4000	Sept. 1997	4	36	48	0	8	32	32G	1.5M	●	●	●	IP and MAC address	●	●	8	●	●	8	●	12		$1,183
YAGO Systems, Inc. (408) 774-2900 www.yagosys.com	MSR 8000	March 1998	2	14	56	14	0	16	16G	15M	●		●	MAC address, IP, IPX, TCP/UDP port number	●	●	4	●	●	4	●	12	●	$3,500

Chart features switches with four or more Gigabit Ethernet ports. Products highlighted in color were tested. **NA**-Not applicable **Unltd.**-Unlimited

CHART COMPILED BY SUZANNE GASPAR

for other LAN types. Most of the switches in the chart support 10/100 Ethernet along with or in lieu of Gigabit Ethernet ports. Common packet sizes and formats make this a fairly clean mixture.

But several Gigabit Ethernet switches also support ATM, and in a few cases, FDDI. Moving data between these different high-speed LAN technologies is significantly more complex. If you're considering concurrently operating and interconnecting Gigabit Ethernet with ATM or FDDI, make sure you understand the throughput and latency implications.

Search for standards support

Keep in mind that the interoperability of current Gigabit Ethernet products is primarily based on just one flavor of Gigabit Ethernet — the part of the IEEE 802.3z specification defined as 1000Base-SX. Although the Gigabit Ethernet standard won't be formally ratified and adopted until some time next quarter, it's already considered stable. Gigabit Ethernet vendors have implemented interoperable switches based on the full-duplex form of 1000Base-SX, which runs over multimode optical fiber. What's more, all the vendors featured in the Buyer's Guide chart have guaranteed to upgrade their customers' Gigabit Ethernet switches to meet the standard.

However, the Gigabit Ethernet specification is warranted to run only up to 260 meters over the type of fiber that's installed in most sites. Most vendors will guarantee that their products work up to 260 meters, and a few are willing to extend that warranted distance to

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about 500 meters.

The distance limitation could stifle Gigabit Ethernet's use in campuswide applications for now. Subsequently, many vendors intend to support a second flavor of Gigabit Ethernet called 1000Base-LX. This specification addresses the distance limitation because it is designed to run over single-mode fiber, which supports maximum distances of 3 to 10 km.

Very few 1000Base-LX options were shipping as of late last year, though several are due for release this quarter. Most vendors' 1000Base-LX switch implementations are brand-new and may not have been thoroughly tested yet for distance or interoperability. And in a year or so, you can expect to see a standard for running Gigabit Ethernet over unshielded twisted pair cable.

The Gigabit Ethernet standards committee is reportedly still finalizing a few other issues, such as some aspects of autonegotiation and flow control. These don't necessarily pose interoperability problems, however. For example, one standard that is still incomplete will define how switches autonegotiate between half- and full-duplex modes at connection setup. But because everyone is only implementing full-duplex Gigabit Ethernet at this time, negotiating for half-duplex is a moot point.

Unlike its older Ethernet siblings, Gigabit Ethernet arrived at the same time as new standards for virtual LAN operation and setup. Look for a switch that supports the IEEE 802.1q standard, which spells out how to denote VLANs and how to tag packets. Many switch vendors were still implementing standards-based VLANs late last year, and no company that we contacted has performed any VLAN interoperability testing yet.

However, the Buyer's Guide chart shows that the VLAN features of different Gigabit Ethernet switches are fairly consistent. All support VLANs based on port groupings. All but a few also support VLANs based on MAC addresses, as well as VLANs based on network-layer protocols.

Also investigate each device's routing support. Most Gigabit Ethernet switch vendors claim their products can function as high-capacity IP routers, though many are still working on implementing and delivering this capability.

Gigabit Ethernet switch vendors clearly differ in their IP routing implementations and IP protocol support, as evident in the accompanying chart. Their routing throughput rates also vary considerably, though many claim their devices can route IP at the same speed and rate at which they switch.

If you evaluate all of these factors before taking the plunge, you'll increase your chances of forming a Gigabit Ethernet relationship that works for the long haul.

Mier is president of Mier Communications, Inc., a network consultancy and product test center in Princeton, N.J. He can be reached at ed@mier.com.

Absences duly noted

When you peruse the accompanying Buyer's Guide Chart on Gigabit Ethernet Backbone Switches, you may notice the absence of some well-known products.

For instance, Gigabit Ethernet pioneer Alteon Networks, Inc. declined to submit information for its ACEswitch 110 Gigabit Ethernet switch because it considers the product a server switch, not a backbone switch.

Alteon defines a server switch as a new class of device designed with features to enhance inter- and intra-server communications, such as dual homing and extended frame sizes.

Meanwhile, GigaLabs, Inc. pulled out at the last minute, conceding that the Gigabit Ethernet-enabled model of the GigaStar 8000 would not ship as planned by the first quarter of 1998, which was a requirement for inclusion in the chart. The GigaStar 8000 will go into beta release this quarter, according to a company spokeswoman.

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WEB TOOLS HELP AUTODESK PRY PERSONNEL FROM THE PHONES AND PROMOTE SELF-HELP EFFORTS.

The help desk's best friend

By Charles Bruno

It's just before 1 p.m. on a raw, rainy day in this Northern California hamlet, but a couple of folks are nonetheless walking their dogs in front of the Copper Top building, home to Autodesk, Inc.'s Assistance Center help desk. Autodesk is a wildly successful computer design software maker that's also made some remarkable changes to its network and IS help desk.

Having their dogs around *helps keep the stress level down for Autodesk staffers (L to R) Kevin Clark (with Beethoven), Shellie Byers (with Mollie) and Tom Barthold (with Kona and Cedar, in front). But it's Web technology that enables them to break free from the help desk and tackle projects aimed at boosting customer service.*

DAVID POWERS PHOTOGRAPHY

Inside, Tom Barthold, manager of the company's Assistance Center, is throwing around some impressive statistics. A year ago, Autodesk began offering employees access to the Assistance Center's Virtual Help Desk via the company's intranet. Since then, phone calls to help desk staffers are down 49%, and e-mail notifications are down 86%. More than 50% of all calls are lodged via the Web today, he says. That's enabled Barthold to cut phone staff by more than half — from four staffers working five hours per day each to two working only four hours each.

The Web also has made it easier to process pleas for help that are sent electronically. It used to be that help requests sent via e-mail would sit in a queue until a help desk staffer could pry himself from the phones. Then it took an average of three minutes and 19 seconds to process each e-mail request, cutting and pasting the necessary info into a call tracking system. And help desk personnel would often have to call back users to get missing information.

Now when employees need help, they fill out slick forms from their Web browsers that prompt them for all the necessary information, including their own coded assessment of the severity of the problem. With a single mouse click, they send the notification on to staffers at the Copper Top facility. It takes a mere 15 seconds to process this kind of request, and Assistance Center staffers routinely echo back a reply within 30 seconds, assuring the user the problem is being addressed. The request then gets handled by an Assistance Center staffer or is escalated to a higher level engineer.

Moreover, end users can check on the status of their logged calls rather than tie up Assistance Center personnel. Prior to the Webification of the help desk, 14% of all calls were labeled as status requests; now that's down to just 8%.

Barthold makes no bones about the effectiveness of Web interfaces for network and IS help desks. "Get your services on the Web as fast as possible," he says from his cube parked among other staffers. "In the six years I've been running the help desk, it's produced the greatest amount of time savings."

That has freed up time for staffers to take on other projects aimed at improving customer service. And that they have. The Help Desk Institute, a national association, honored Autodesk's Assistance Center last year for its technical innovations.

Beethoven meets Spiderman

Barthold, or Bart as he's known around these parts, talks in subdued tones. Soon, though, an uneasy growling breaks the silence.

No, it's not help desk agents with frayed nerves. It's Beethoven, supervisor Kevin Clark's dog, warning another pooch to stay out of his master's cube. Autodesk is a pet-friendly company, and several help desk staffers work with their dogs nestled at their feet, the thinking being it helps reduce stress (Clark's, not Beethoven's).

Autodesk uses Remedy Corp.'s Action Request (AR) Web to handle all events submitted to the Assistance Center via the 'Net, Clark says, as Beethoven sleeps under the desk, his territory secured. The Web interfaces also pay dividends in terms of managing the help desk, he says. For instance, it automates reports on the number of calls handled, work in process and backlogs — items he otherwise would track manually.

AR Web also lets help desk staffers design Web forms that force employees to enter complete information before submitting a problem, thereby ensuring the Assistance Center receives detailed trouble reports and eliminating callbacks for additional data, Clark says.

The Web also helps users help themselves. Assistance Center staffers have planted scores of extensive FAQ sheets and request forms on the Virtual Help Desk site, helping users quickly navigate to the information they need. Now the help desk team is moving to the next step.

Autodesk plans to deploy Service-Soft's AR System Web Advisor to increase the self-help services available to intranet users, he says. The tool will return a series of possible fixes in response to a user's description of a problem. The program also tracks which options the user tries, so if the customer gives up and submits the problem to the help desk, the support engineer has a detailed record of what steps have already been taken.

Jon Cooney, a support specialist at the Assistance Center who is better known as Spiderman (he wears a ring bearing the face of the superhero and has an inflatable life-size Spiderman clinging to the ceiling tiles above his desk) estimates the knowledge base can reduce by 15% the 5,630 calls that reached the help desk last quarter.

"It's more front-line defense for us," says Cooney, who is overseeing deployment of Web Advisor in between answering calls. "Call avoidance is a huge time savings since we don't have to do the detective work."

Trend spotter

While Cooney is focused on rolling out Web Advisor, Hans Henningsen, an intranet tools architect at the Assistance Center, spends his days poring over help desk statistical reports, looking for problem areas to address. "What you can measure, you can change," he says. Recently, he discovered that 41% of all calls coming to the help desk stemmed from either e-mail administration problems or e-mail account issues.

That meant almost an entire year of one help desk staffer's days could be spent administering internal e-mail lists. In response, the company nailed up information alerts on the Web site suggesting ways to deal with common messaging problems. Per Henningsen's suggestion, there's also now a form on the intranet that users can fill out and send directly to maillist owners when they want to hop on a list, instead of flooding those requests to the help desk.

"We just bought ourselves back 400 person days," Henningsen says.

It all comes down to providing quality service to the customer, Barthold says.

"You have to get users to overcome the fear that their problem is going to go into a black hole," Barthold says. The Web is a powerful vehicle for doing that, with its ability to provide users with extraordinary sums of data relating to their IS problems.

While Beethoven and the other dogs may help lend a tranquil atmosphere to the Assistance Center, it looks like the Web is a help desk staffer's best friend.

As Barthold says, "It's all just a click away on the Web."

When he wrote this story, Bruno was enterprise editor for Network World. *He now is managing editor of publishing products at The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, Ext. 118.*

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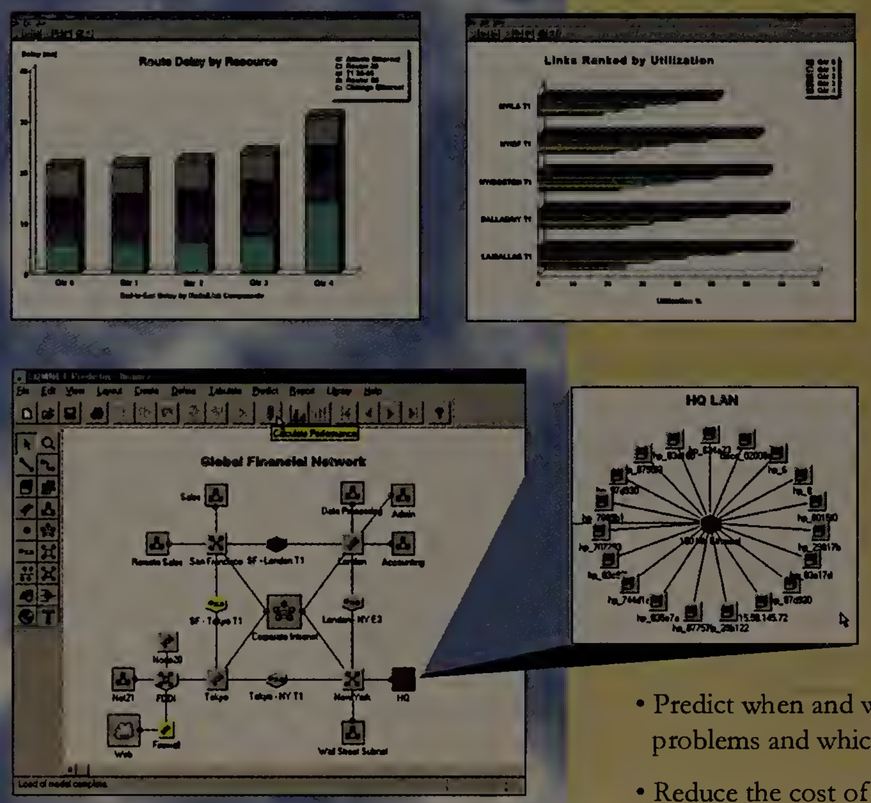

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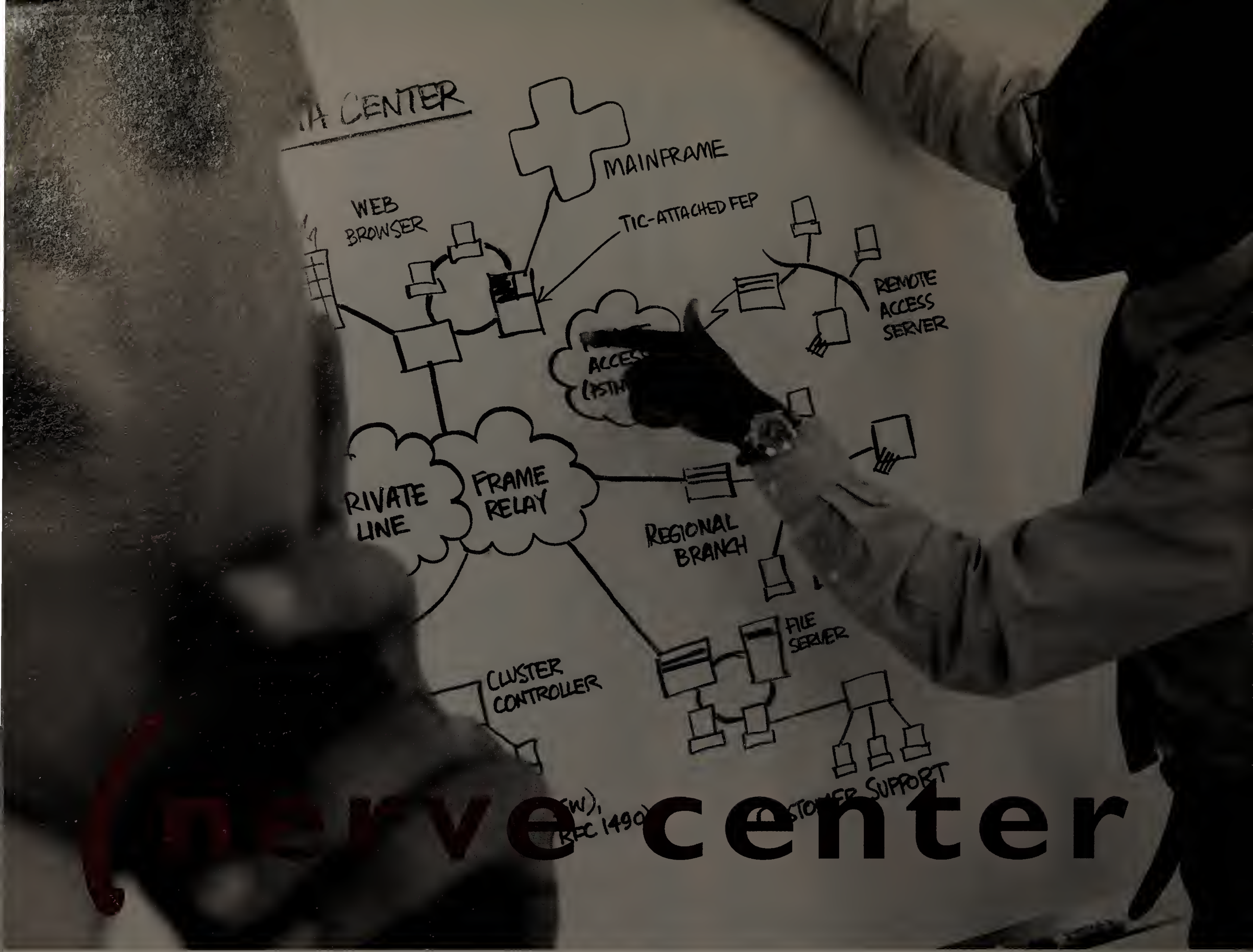

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Pulling rank

Tips to help new managers adjust to their new roles and successfully manage their former peers.

By Sandra Gittlen

Richard Colella had no idea what he was getting himself into.

When he asked to become manager of his network protocols group, he thought he was on the path to success at the National Institute of Standards and Technology, in Gaithersburg, Md.

More than five years later, after suffering ridicule, stomachaches and enormous amounts of tension, he finally asked to be demoted back into his group. It was the happiest day of his life.

"I went from a technical job where I was doing the work to managing people who were doing the work," says Colella, who has since moved on to become a lead network architect at America Online, Inc., in Reston, Va. "I hadn't recognized that I had changed jobs."

This is one of the most crucial mistakes new managers make, according to Peter Economy, coauthor of the book *Managing for Dummies* and general manager at Nelson Motivation, Inc., in San Diego. "It's not making the transition from doer to manager."

Economy says this is particularly prevalent in network fields, where the only way to advance in a company is to step up from a technical position into a management role. "People have spent more time managing networks than they have talking to other people," he says.

As Colella found out, not everyone is meant for management. He went from being best friends with his coworkers to being ostracized and laughed at. "They would talk about me and didn't come into my office," Colella says. "My peers were now other managers."

Paulette Dwen, membership director of the Association of Support Professionals, says that is a common problem. "It's a balancing act," she says. "You still want to be friends, but you have to establish authority."

Economy says there are several ways to do this.

First, "you have to approach it with maturity, make it clear that this is a responsibility you have been given," he says.

Economy suggests taking your team out to lunch or planning a meeting where you announce your position and your agenda.

"Establish company goals, work goals and standards to be adhered to," he says. Then make sure to meet with each team member one-on-one and discuss individual goals. It is in this meeting that you should tell them you are still friends, but things have changed, Economy says.

STAN BAROUH

After his promotion *at the National Institute of Standards and Technology, Richard Colella went from being best friends with his colleagues to being ostracized.*

"People will try to take advantage of you if you're not clear," he says. When dealing with your friends, learn to give reasons for everything, so there is no room for argument.

Accountability and deadlines should be adhered to, Dwen says. "Once you let a person slip up, it's hard to get back that respect." She recommends writing out group expectations on a whiteboard in the office for everyone to see.

Riding the crazy train

Economy says it also is important for a new manager to get training. This could be achieved through programs at your company or by reading books. Colella recommends *Becoming a Technical Leader,* by Gerald M. Weinberg.

"It's a dangerous situation to have a manager without training," Economy says. "If something goes wrong, there are legal ramifications."

Colella says the best situation is to have total support from your immediate supervisors and to have one manager in particular who will train you and monitor your progress. He says having such a mentor is critical to becoming a good manager.

But all too many times, especially in small companies, people are pushed into management without any support or training.

Turnando Fuad, president of NSNet, a small Internet service provider in Sacramento, Calif., says he does not have time to formally train his growing team of managers.

"We are growing fast," Fuad says of his company, which now numbers 21 employees. Fuad recommends books for his managers to read and is working on automating performance reviews and other human resource tasks.

In the meantime, he says the company has started looking outside for managers so that his technical people can stay focused on their projects.

Colella says sometimes training is shunned by new managers who think they can jump right in and take over. "A couple of weeks of training throughout the year is really useful," Colella says. "Most people aren't natural managers."

Dwen echoes that theme. "You have to master dealing with interviews, running meetings and interpersonal communication," she says.

Social butterflies

One of the most difficult parts of becoming a manager of your team is separating your personal and professional lives, Colella says.

He says that as soon as he became a manager, he had to distance himself from his friends socially. "You have to be willing to step away from the relationships for awhile," he says, noting that employees need time to go out and talk about work, even negatively, without their "boss" around.

"Initially, don't attend every function," Economy agrees. "Then ease back into it, but remember, you now have to be positive and uphold the company values."

"Being able to calmly tell someone they need improvement one minute and then turn around and say, 'Let's go have a beer' — that's a talent," Colella says.

As important as it is to try to succeed at being a good manager, it is just as important to admit when you are not, Colella says.

He realized that he was not helping his team or himself after 5 1/2 years.

"You have to recognize your strengths and weaknesses," Colella says. "If you find yourself not looking forward to coming into work for a few months, then it's time to give it up." ■

TIPS FOR MANAGING YOUR PEERS

1. Recognize that you are now a manager, not the one doing the work.
2. Announce your new position and goals.
3. Set team and individual goals.
4. Meet with each team member separately to discuss your new position.
5. Make sure to document all interactions with team members, including performance reviews and project discussions.

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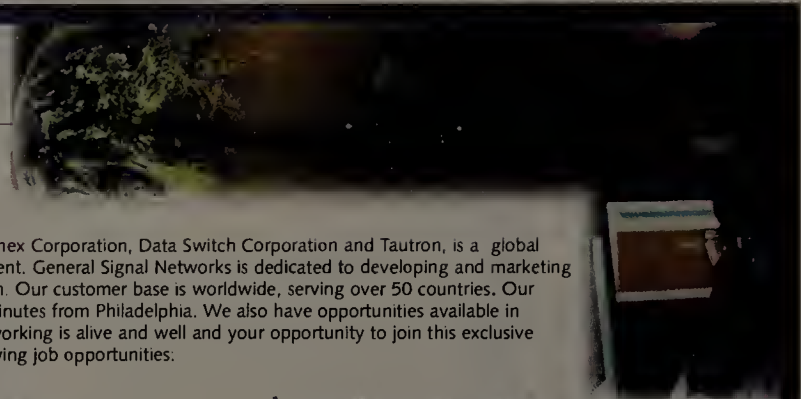

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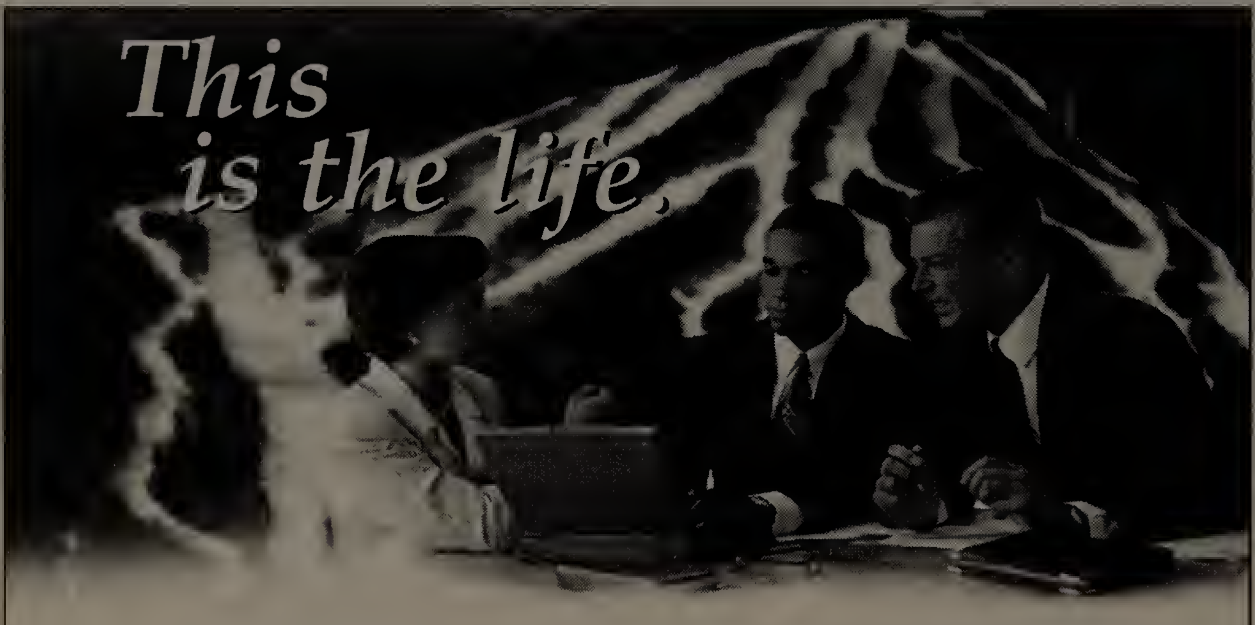
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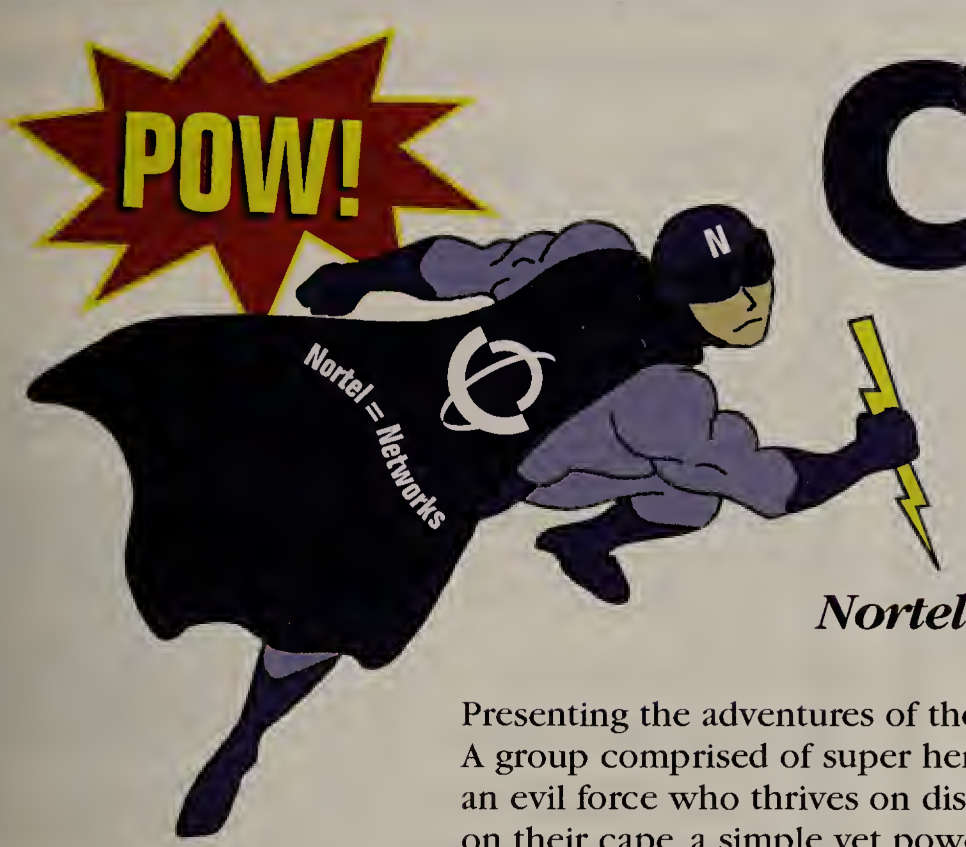

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Bull Worldwide Information Systems will be attending the ComNet Show Monday, January 26th through Thursday, January 29th, at Booth 1463. In conjunction with the show, we invite you to speak with our technical recruiters at the JOBfest Career Fair, Tuesday, January 27th and Wednesday, January 28th, at Booth 13 at The Renaissance Washington Hotel between 10:00am & 5:30pm.

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- 24 x 7 envt.
- UNIX, C, Perl
- Heterogeneous Network envt.

Data Communications Directors
- 10+ years exp. technical operations management
- Strong personnel mgmt. skills
- Network mgmt., large systems, 24 x 7 envt.

OPERATIONS TEAM

Network Project Managers
- Exp. coordinating implementation of networks
- Strong data communications tech. knowl.
- Excellent organizational & communication skills

Network Engineers
- 5-10 years exp. w/design, installation/debugging of large routed & switched networks
- High design/architecture exp.
- Debugging skills at all levels of Ethernet, FDDI & TCP/IP protocol family

Network Architects
- Hands-on design of routed TCP/IP networks
- Solid understanding packet filtering & network security
- Ability to access future and current network req.
- Strong knowledge of BGP

Network Tools Developers
- Exp. developing automation tools in a UNIX envt., ideally in Perl
- Knowledge of TCP/IP network configuration, SGL, CGI & JAVA

UNIX Systems Administrators
- 3+ years UNIX administration
- DNS, NFS, TCP/IP, & Sendmail
- PERL/Shell scripting, C
- HP/UX, SGI, SUN, DEC

Jr. UNIX Systems Administrators
- Monitoring & troubleshooting h/w & s/w problems in large scale 24 X 7 UNIX envt.
- BS/CS and/or 1-5 years exp.

Sybase DBAs/Systems Administrators
- 3-10 years exp. Sybase DBA w/strong knowledge of Transact-SQL
- Sybase performance monitoring & tuning
- Shell/PERL Scripting, and C prog. of dblib
- Data modeling exp. desirable

Tandem DBAs
- 3+ years exp. Tandem DBA
- Non-stop SQL, performance tuning

Web Server System Administrators
- General UNIX System admin. skills
- Strong DNS admin. skills
- http & TCP/IP networking analysis & diagnostic skills
- Solid scripting skills

DEVELOPMENT TEAM

PL/1 Programmers
- Stratus, IBM, 2+ years exp.
- Knowledge of RDBMS & UNIX
- C/UNIX, Client/Server

Project Managers/Coordinators (located in Northern VA and Irvine, CA)
- Dev. exp. in UNIX or Win highly desired
- Strong analytical & organizational skills
- MS Project

QA SW Testers (located in Northern VA and Irvine, CA)
- 2+ years UNIX, Windows 95 or Mac Testing
- Automated test tool Implementation
- Dev. Test Plan documentation
- VOS a plus
- Development exp. highly desired

C/UNIX Software Engineers
- C/C++, UNIX dev. exp.
- Sybase, SQL
- PL/1, PERL, Stratus, TCP/IP
- OOD, Client/Server

Software Engineers (located in Irvine, CA)
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- C/C++
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Sr. Research Engineers
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- Strong DSP background, working knowledge image coding, object-oriented envt.
- Solid knowledge of TCP/IP and Windows 95 highly desired

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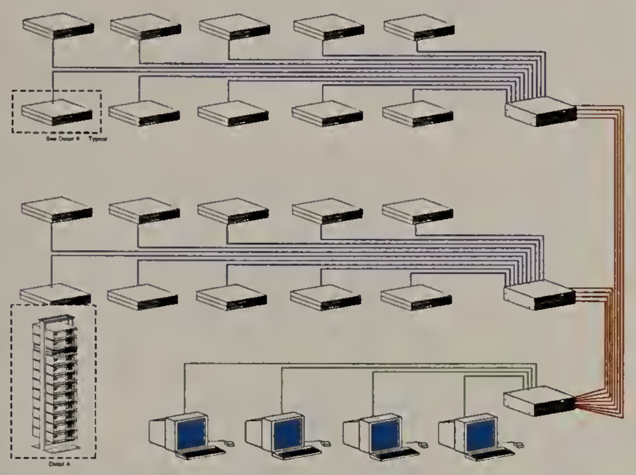

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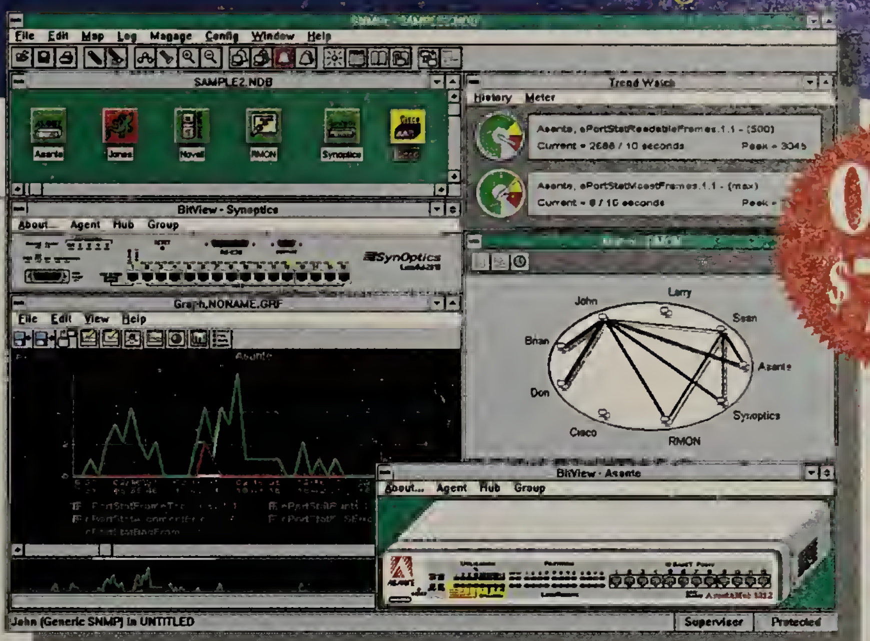

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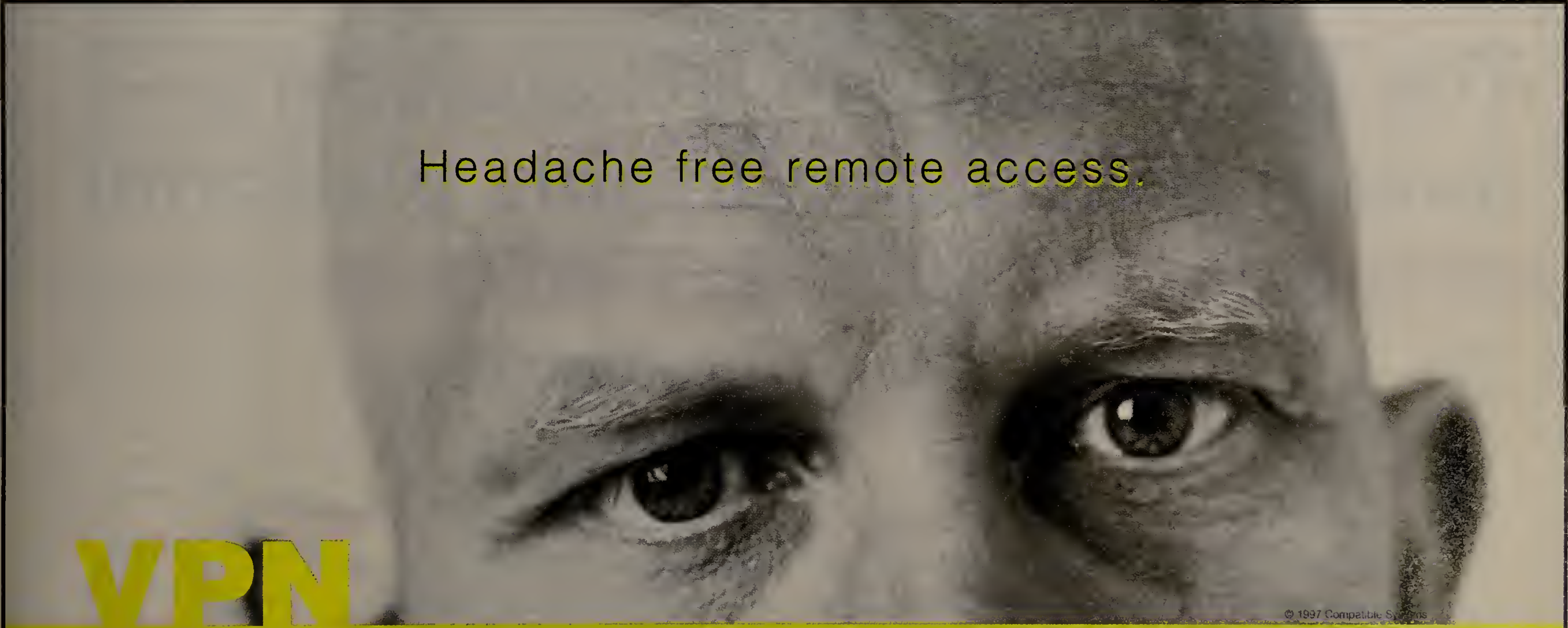

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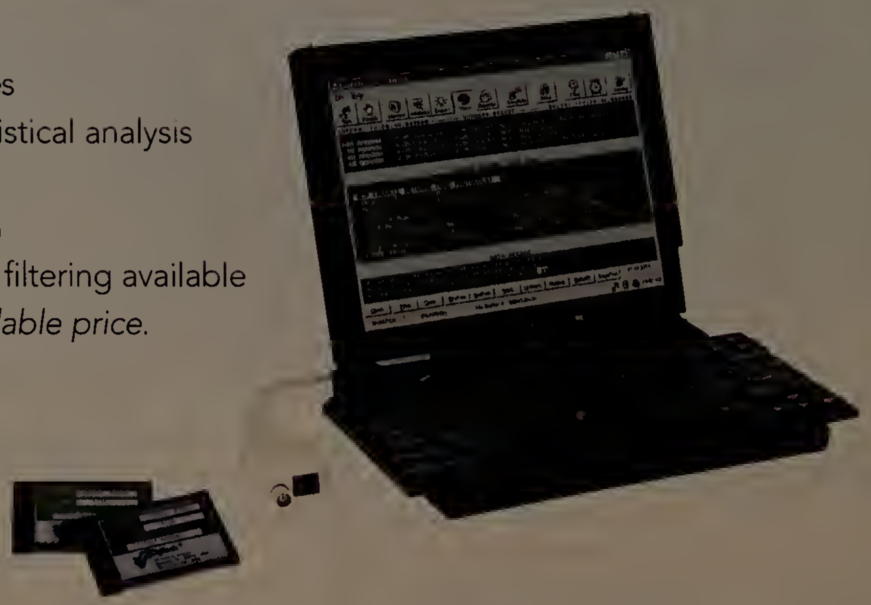

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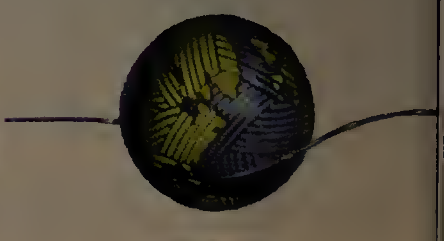

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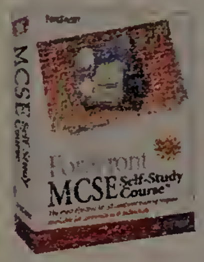

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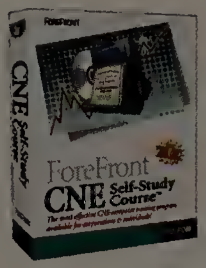

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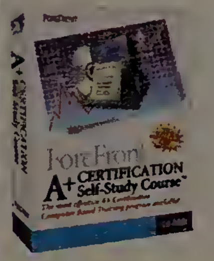

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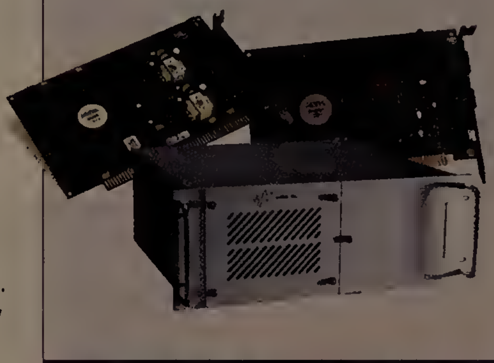

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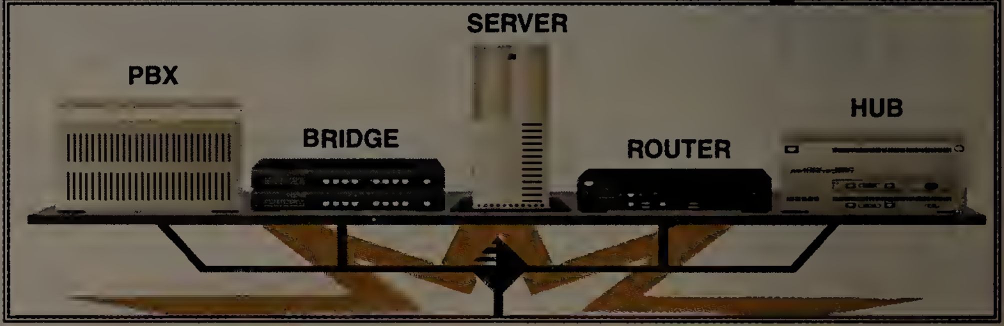

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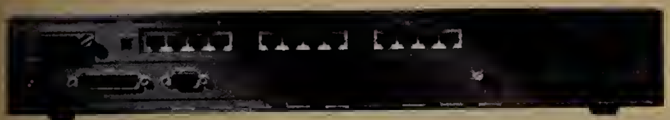

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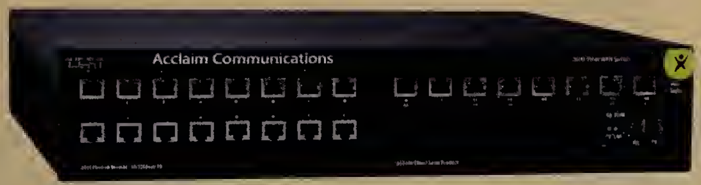

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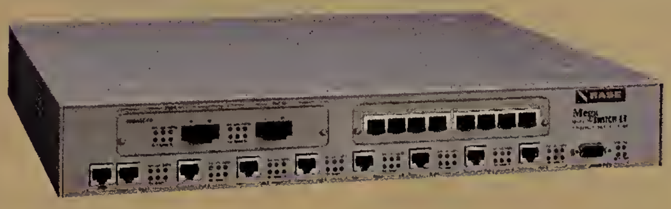

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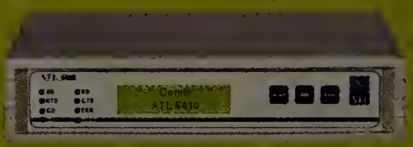

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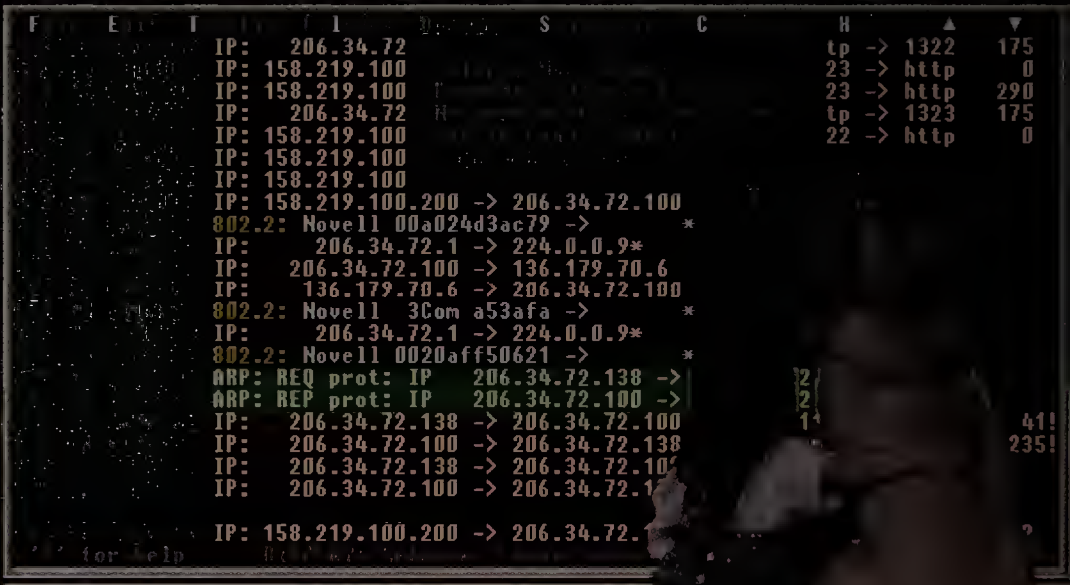

```
IP:    206.34.72                                    tp -> 1322   175
IP: 158.219.100                                     23 -> http     0
IP: 158.219.100                                     23 -> http   290
IP:    206.34.72                                    tp -> 1323   175
IP: 158.219.100                                     22 -> http     0
IP: 158.219.100
IP: 158.219.100
IP: 158.219.100.200 -> 206.34.72.100
802.2: Novell 00a024d3ac79 ->          *
IP:      206.34.72.1 -> 224.0.0.9*
IP:    206.34.72.100 -> 136.179.70.6
IP:     136.179.70.6 -> 206.34.72.100
802.2: Novell  3Com a53afa ->          *
IP:      206.34.72.1 -> 224.0.0.9*
802.2: Novell 0020aff50621 ->          *
ARP: REQ prot: IP   206.34.72.138 ->
ARP: REP prot: IP   206.34.72.100 ->
IP:    206.34.72.138 -> 206.34.72.100                            41!
IP:    206.34.72.100 -> 206.34.72.138                           235!
IP:    206.34.72.138 -> 206.34.72.10
IP:    206.34.72.100 -> 206.34.72.1

IP: 158.219.100.200 -> 206.34.72.
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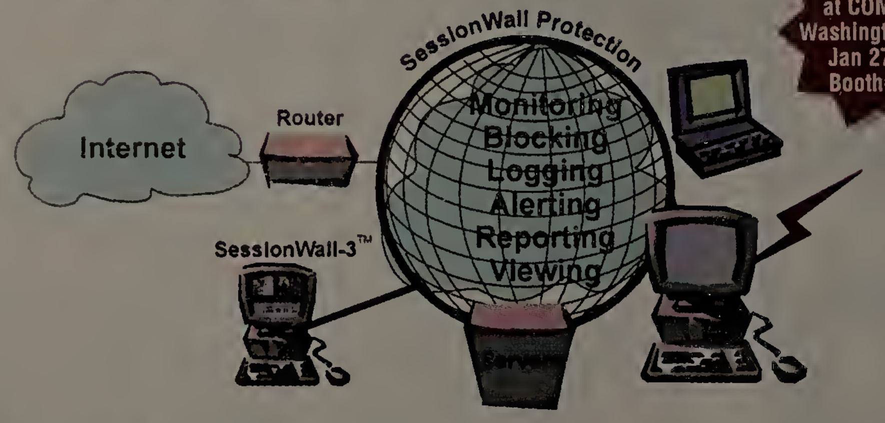

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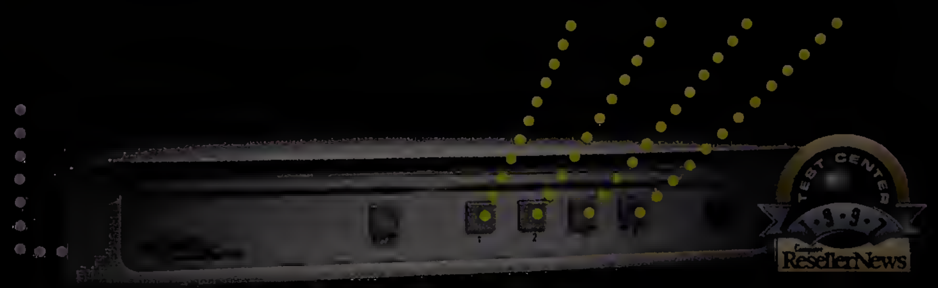

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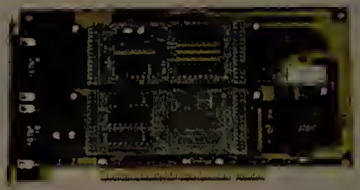

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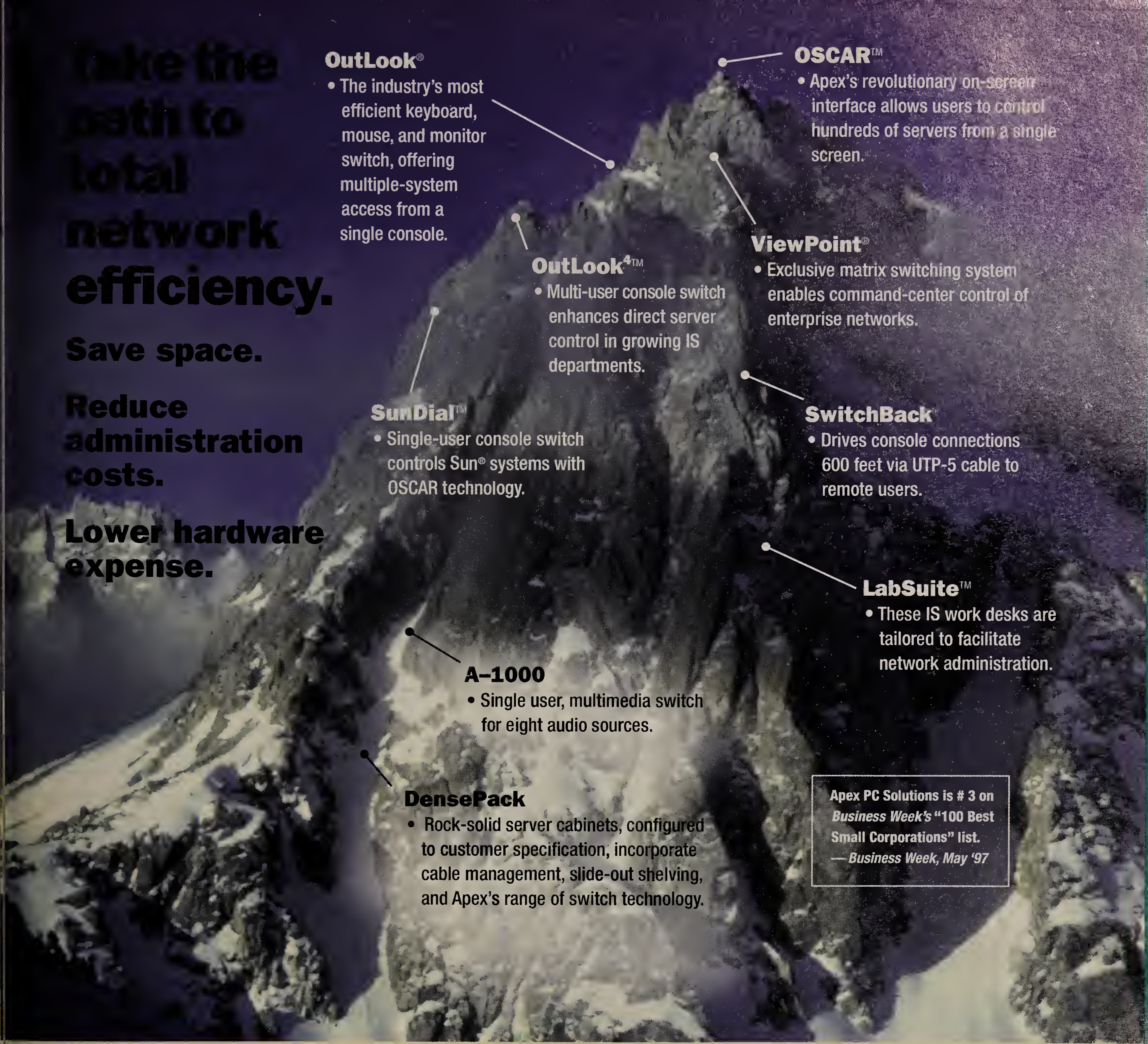

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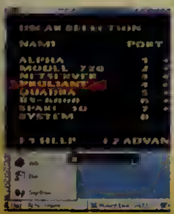

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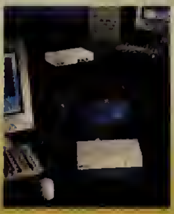

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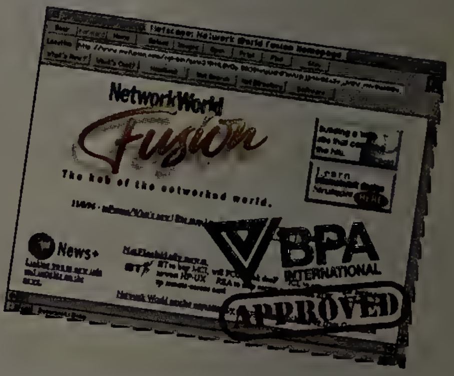

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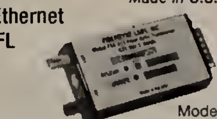
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Snow job

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SPECIAL REPORT

communications lawyer Rodney Joyce, but the users contacted by *Network World* said they never paid Joyce to write the brief.

Instead, they said Joyce contacted them to cosign what they thought was an objective statement to the FCC on increasing competition in telecommunications.

Who paid for the brief? Joyce's client: BellSouth.

Welcome to Washington, D.C., where the two-year-old Telecommunications Act of 1996 is falling apart and two groups of warring carriers have desperately sought to marshal a confused public to their way of thinking. They employ "user groups" that produce surveys, filings and studies proving it is the other guy's fault.

The trend disgusts the tiny band of advocates who actually represent — and are paid by — corporate network IS managers to get the FCC to do right by users.

"We can identify and bring consumer support to bear on projects. We have close ties to the major players in education and consumer groups, minorities and the disability community."
—Issue Dynamics, Inc.

"The carriers who fund these front groups believe the organizations bring some cover to their arguments," fumed James Blaszak, a Washington, D.C. lawyer who represents about 20 large corporations, such as American Express Co. and Procter & Gamble Co., on issues before the government. "But I don't think the groups help the FCC do their job one bit."

The piper pays

Many of these groups attempt to sign up phone company customers in their own particular way.

Most have recruited a variety of community, ethnic, small business and senior citizen activist groups to join the groups for nothing or a nominal sum and appear on their masthead.

Some even go after corporate network IS managers. But often that just confuses the matter further, with users sometimes winding up expressing almost the opposite of what they actually intended.

For example, J.B. Shah, director of information technology for Electroglas, Inc., in Santa Clara, Calif., said Joyce's appeal for support caught his eye because Pacific Bell's charges for local calls now are more expensive than long-distance charges for calls across the country.

"I feel that Pacific Bell is a monopoly, and they file one petition after another to raise their rates," Shah said. Shah signed the Ad Hoc Coalition letter because he thought it meant he was supporting increased local competition.

When told that his long-distance carrier, AT&T, opposed BellSouth's long-distance petition on the grounds that it would *reduce* local competition by ending BellSouth's incentive to open its local markets, Shah said he did not realize that.

He also said he did not realize that in November Joyce had submitted a virtually identical brief from the Ad Hoc Coalition to the FCC supporting Bell-South's long-distance entry application for Louisiana.

Joyce and a BellSouth spokesman confirmed that BellSouth paid for the legal work, but neither brief mentioned that fact.

"Our role has been to attempt to identify people who seem to have a shared philosophy about how best to promote competition," Joyce told *Network World*. "But I don't think there's any requirement for anyone to disclose who's paying them."

The blue jeans connection

But the Bells' advocacy work goes well beyond technical FCC filings. The nerve center for much of the Bells' public-advocacy work is a firm called Issue Dynamics, Inc. (IDI), discretely housed in a cookie-cutter Washington, D.C. office building two blocks from the White House. The firm is headed by Sam Simon, a self-styled '60s activist-turned-corporate advisor who, according to IDI's electronic brochure on the World Wide Web, is "as comfortable in a suit as he was in jeans."

IDI's associates help to organize and manage coalitions with names such as the "Alliance for Public Technology" and "Keep America Connected!" Often these groups run tag lines with unobjectionable goals, such as the stated mission of Keep America Connected! to mount a "National Campaign for Affordable Telecommunications." The literature for each group lists a unique phone number which is manned by an IDI employee who answers the phone with the name of that coalition. It also lists either IDI's street address or a District of Columbia post office box.

OUT IN FRONT

The groups most often accused of being either fronts for local or long-distance carriers or repeatedly biased in their advocacy:

Name of group	Usual position	Major backers
Alliance for Public Technology	300-member coalition supporting expansion of universal service	Receives more than half of its funding from big local carriers
Americans for Competitive Telecommunications	"Alliance of concerned citizens" monitoring RBOC compliance with the telecom act	Has received assistance from Sprint public relations firm Burson-Marstellar
Competitive Policy Institute	Think tank made up of former state regulators and congressional staffers	Receives about $500,000 per year from AT&T
Consumer Federation of America	National consumer organization that repeatedly criticizes RBOCs	Research director Mark Cooper has told state regulators he received contracts from AT&T and MCI
Keep America Connected!	Coalition that emphasizes local competitors' failure to serve residential market	Housed at RBOC-funded consulting firm; backed by RBOC trade association

Drawing on Simon's background, IDI's calling card is its ability to quietly muster public support for corporations' preferred positions on government policy.

"We have close ties to the major players in the nontraditional world — education and consumer groups, minorities and the disability community," brags the company's online brochure. "We can identify and bring consumer support to bear on projects where appropriate," the brochure continues.

Some of the IDI-managed groups actually have achieved some standing. The Alliance for Public Technology has signed up 300 coalition members since 1989, including many universities, and has weighed in heavily on the side of increasing access to new telecommunications services for less affluent people. The group's chairman, Barbara O'Connor, bristled at the suggestion that the alliance is a front for anything, noting that it has even held a seat on the FCC's prestigious Network Reliability Council.

The carriers who fund these organizations believe these fronts bring some cover to their arguments. And the people who run [the carrier's Washington offices] are afraid not to do this stuff."
—Washington, D.C. user attorney James Blaszak

But of the alliance's $190,000-per-year budget, approximately $100,000 is supplied by the regional Bell operating companies, she said.

Not surprisingly, last October the alliance wrote the FCC in support of BellSouth's South Carolina long-distance application and has consistently supported other RBOC policy positions.

O'Connor defended the alliance's practice of every year approaching the long-distance carriers for contributions. "But once you take money from one side, the other side won't give you anything," she said. "They brand you [as an RBOC front] because it's part of the political rhetoric."

Other IDI groups do not have much of a track record. Keep America Connected! was organized in February 1997 and counts 45 organizations as members. Unlike the Alliance for Public Technology, the individual Bells are not members of Keep America Connected!

Instead, the U.S. Telephone Association — the trade association for the nation's incumbent local carriers — is one of the 45 members. The group's literature usually discloses this fact indirectly by describing itself as a coalition of "consumers, people with disabilities, rural and urban residents, senior citizens, minorities, labor and local phone companies."

Yet most of the organization's budget consists of paying for part of the salary of an IDI employee, Angela Ledford, who is listed as the coalition's executive director. And its principal activity appears to be responding in lightning-quick fashion to unfavorable reports about RBOC progress in opening local markets.

For example, two weeks ago the Consumer Federation of America (CFA) issued a report blasting the RBOCs for making scant progress on local phone competition. Immediately, Keep America Connected! countered with a "consumer survey" in which ordinary consumers — who turned out to be mostly staffers of the coalition's member organizations — asked 78 competitive local carriers in 13 cities whether they served residential customers. Only two said they did, according to the coalition's report.

"Are the RBOCs clients of IDI? Yeah. Is Keep America Connected! housed at IDI? Sure," Ledford told *Network World*. "But we made no attempt to hide our connections. Now with the Consumer Federation of America, that's not clear."

Half a million bucks

Indeed, when it comes to advocacy on behalf of the long-distance carriers, it is the CFA that draws the most scrutiny. The organization is the granddaddy of consumer organizations and is highly respected on Capitol Hill and by regulatory agencies. Yet questions have arisen about its research director, Mark Cooper. In addition to his position as CFA research director, he also is president of his own Maryland-based firm called Citizens Research.

In a 1994 hearing before the

See Snow job, *page 76*

Snow job

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Virginia State Corporation Commission, Cooper admitted that he has done survey and research work for AT&T and MCI Communications Corp.

SPECIAL REPORT

Cooper told *Network World* that CFA does occasionally criticize AT&T for its basic residential rates.

But on telecom reform implementation issues, he conceded that CFA basically takes one side of the issue. "You see a great deal of polarization on both sides," Cooper said. "That's just part of the process. That's just Washington."

Indeed, Cooper's work does show an almost vitriolic disdain for the RBOCs.

The CFA report issued earlier this month — the one that triggered Keep America Connected!'s "consumer survey" — charged that consumers would lose as much as $10 billion per year in savings from lower phone bills if the Bells entered long distance before fully opening their local markets.

"Currently there is virtually no significant competition for local telephone service because the Baby Bells have created insurmountable barriers to entry," Cooper charged in his report.

In fact, AT&T is a veritable fountain of research funding. Take the Competition Policy Institute (CPI), established in 1996 and staffed by former state regulators and congressional telecom committee staffers.

In a recent hearing before the California Public Utilities Commission, CPI President Ron Binz admitted that AT&T has provided approximately $500,000 per year to the organization, with other long-distance carriers, competitive local carriers, cable TV and electric utility interests providing the rest.

Not surprisingly, its reports and testimony have consistently laid the blame for the slow pace of telecom reform on the RBOCs. ■

How to find a group you can trust

If a group solicits your support on a telecom policy matter, how can you tell whether the group is legitimate or a front for local or long-distance carriers?

Experts say it really is not that hard to tell, because front groups usually give away the game with hints in their names.

Groups backed by regional Bell operating companies often use terms that refer to preserving or expanding telecommunications as an entitlement. A classic example is Keep America Connected!. The group's hidden agenda, Washington insiders say, is the rapidly expanding federal universal-service requirement, and its message is that new local competitors who engage in cream-skimming could destroy the system of affordable local telecom service.

By contrast, groups backed by long-distance carriers ply the theme of competition to the exclusion of all else; the word "choice" frequently appears in their monikers.

So if carrier-based groups are mercenary, and even broad-based organizations such as the Consumer Federation of America and the International Communications Association are enmeshed in charges of bias, who can you trust to carry out your wishes in Washington, D.C.?

One option is to look at vertical-industry trade associations that are not devoted exclusively to telecom and networking but have picked up some expertise in these matters. For example, the American Petroleum Institute (API) has long spoken out to the Federal Communications Commission on issues that threaten to raise costs for big users, regardless of whether the blame is to be laid at the feet of the local carriers, long-distance carriers or the FCC.

The National Retail Federation (NRF) in recent years has jumped into the fray, especially on matters affecting dial-up data lines at point-of-sale terminals, such as occasional threats to base universal service and access fees based on call setup rather than minutes of use.

In fact, in 1995 the NRF hired two expert telecom lawyers away from the API just for this purpose. Likewise, the American Trucking Association has gone to war with the FCC over new charges that repeatedly have raised the cost of 800 calls, especially those originating at pay phones.

— *David Rohde*

Netscape

Continued from page 1

companies and others to distribute the client software without paying a cent.

But the real shocker was Netscape's pledge to post the source code for its upcoming Communicator 5.0 suite early next year, allowing developers to modify and reuse the product of so many Netscape man-hours.

This move seems to signal Netscape's attempt to regain its influence over the Internet. Netscape hopes that these aggressive programs will not only help it gain back its lost market share in the browser market, but also give the company a stronger hand in future battles with Microsoft. With more browser market share, Netscape believes that its other offerings can hop more easily into enterprises, a market the company is increasingly relying upon for revenues.

Netscape's *Barksdale wants to seed the market with client software.*

"Client market share is the seed corn for our enterprise software business and Netcenter, our online Web site service business," said Jim Barksdale, Netscape's president and CEO. "We're excited about the Web site . . . because we get significant revenue from that and think that it can grow and prosper. But we're also very committed to building enterprise software products. On one hand we're like an Oracle [Corp.], and on the other hand we're like a Yahoo [Inc.]."

Netscape will create a special Web site that will enable developers to download source code, post modifications and participate in newsgroups for collaboration and discussion.

The company also promises to continue to give away the source code. "By giving away the source code for future versions, we can ignite the entire 'Net community and rally it around the Communicator platform," said Mike Homer, Netscape's executive vice president of worldwide sales and marketing.

Homer indicated that the process is similar to those that made the Apache Web server so popular. He said the license that accompanies the download of Apache source code requires a developer to offer any enhancements back to the Apache community for potential inclusion in later releases.

Netscape indicated that it would review all enhancements and decide which would end up in its branded commercial release. While any company could release its own browser based on Netscape's source code, only Netscape's version could carry the Netscape logo.

Rob Enderle, senior analyst for Giga Information Group, Inc., of Santa Clara, Calif., thinks that these moves can result in a 10-point increase in Netscape's market share. But he also notes that such a gain may come with a price if Netscape isn't careful.

"The source code, without controls on it, can create a number of service and support problems. This might cause pages to not display correctly or applets to not load properly," Enderle said.

Netscape customers were pleased with the news. "It's going to help spawn an open environment and additional competition to decrease Microsoft's hold. It should make it a more fair market," said Steven Durflinger, software project manager at Los Angeles-based Southern California Gas Co.

ⓒ Netscape: (650) 254-1900

Microsoft cries 'uncle'; separates Win 95 and IE

Microsoft Corp. settled its contempt-of-court case with the U.S. Department of Justice Thursday and agreed to provide two more options to OEMs looking to license Windows 95 on their machines. The software company said it will supply one version of Windows devoid of the Internet Explorer (IE) icon and most IE files, as well as a version that simply removes the icon.

Microsoft officials are still confident, however, that customers will seek the Windows IE combination.

Resolving the contempt complaint does not mean Microsoft's legal problems are over. The company still is appealing the basic government contention that forcing OEMs to take IE in order to load Windows 95 violates a 1995 consent decree that prevents Microsoft from tying one product to another.

The big question remains Windows 98, which more fully integrates the browser and the operating system. Microsoft says the Windows 98 shipment schedule is "steady as she goes." However, Joel Klein, U.S. assistant attorney general for antitrust, said in a statement that the government would continue to investigate extending Judge Thomas Penfield Jackson's ruling to future Microsoft products.

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Backspin

A bit on Microsoft, a bit on Web problems

<Bit One> "Complex problems have simple, easy to understand, wrong answers."

— *Grossman's Misquote*

Ms. Reno! I have the answer! I take it all back. We do need to regulate Microsoft. My thinking on this is that we regulated the electricity industry, and now we're deregulating it.

Now, for the electricity industry, it took some 30-odd years to go from regulation to deregulation. Today, with computer industry time running in what the wretched digerati are pleased to call "Internet years" (something around 20-to-1), we should therefore deregulate Microsoft after about 18 months.

Mark Gibbs

End of story, and everybody is happy. </Bit One>

<Bit Two> My wife's passion is horseback riding, and she's very good at it. Because of this, I have learned the truth of the axiom "One horse is not enough and two horses are too many."

The horse world is full of quips. One that I like a lot is "Handsome is as handsome does." This means that a horse is only really handsome if it performs.

The same applies to Web sites. There are many that look great but fail to be great because they just don't do it right.

If you logged on to Network World Fusion on 1/12/98, you might have caught an article titled "Can You Buy It?" (www.nwfusion.com, Doc Finder: 5324). This feature says Dell is selling about $3 million worth of computers online per day while Cisco is moving some $9 million worth of products per day via the Web!

Impressive figures, but I can't figure out how they do it. For example, a buyer who used Cisco's Web site is quoted as saying, "You'd better know exactly what you're looking for because it's complicated."

Exactly! That's part of my point. Many sites look great, but they just don't function well. It is not just Cisco; the same problem applies to hundreds — no, thousands — of sites.

Just trying to find something on many vendor sites can drive you to distraction. It seems as if searching is an afterthought, and logical organization of content is assumed to be irrelevant.

For example, I just went to the *Los Angeles Times* site to see if I could find an article that was published yesterday. I swear it was published, but I tried every way I could and the thing apparently doesn't exist online.

<digression> There's something else about the *L. A. Times* that really surprises me: If you want to see anything prior to today's issue, the *Times* wants to charge you $1.50 per full text article retrieved. Don't you think that's awfully expensive? </digression>

The second point I want to make is about details online. I am so tired of looking for prices, company addresses and public relations contacts on Web sites. They are usually hidden in odd, dusty corners or simply left out.

Check your own Web site. Approach it from the viewpoint of someone who has never seen it before or get your significant other to test it. See how long it takes to find your street address, phone numbers and contact people for sales, public relations, accounts and marketing. You may be unpleasantly surprised.

My third point is about content currency. Some of the sites I visit boast that they were updated a day ago, yet their content obviously wasn't.

And when you find that the prices they quote on their sites are no longer valid, or their product line-ups have changed, you've got to conclude they aren't too savvy when it comes to the Internet. Considering how much it costs to create many of these Web sites and how much is at stake, you'd think the site owners would have found and fixed the problems by now.

There is an explanation in another horse-related saying that is applicable here: "God, in His bounty and generosity, always creates more horse's asses than there are horses to attach them to."</Bit Two>

Bon mots and opinions to nwcolumn@gibbs.com or on (800) 622-1108, Ext. 7504.

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

ONE LUCKY BUYER MAY BE BROWSING After months of hand-wringing, Netscape finally got aggressive last week by announcing it would offer its Web browser for free (see story, page 1). The company may as well give away its browser, since it has already given away much of its browser market share.

Netscape's untenable competitive situation — we're talking about a start-up going *mano a mano* with Microsoft — and recent cost-slashing measures have increased rumors in financial circles that it is looking for a buyer.

Sure, there are the usual, logical suspects — **IBM, Sun** and **Oracle.** But we get paid to "think outside the box," so we've developed our own list of potential buyers and their plans:

- **Trilateral Commission.** Marketing Netscape Communicator could provide "friendly face of ineptitude" for shadowy international cabal of bankers and other members of ruling elite as it pursues world domination.
- **Disney.** Word on the street is that it would dismantle the company, but cast **Marc Andreessen** in a new TV show as a brooding, world-weary "Gen X" genius who drives dad **"Big" Jim Barksdale** crazy with his wild money-making schemes and unkempt appearance. To make more accessible to mainstream audience, setting would be changed from software industry to shoe store.
- **Seattle Mariners.** Two words: Browser Day.

This is merely our short list. Let us know if you hear of any dark horses emerging.

SELF-ENLIGHTENMENT IS BEST ACHIEVED WITH INTERNET EXPLORER It could be a belated attempt to generate some desperately needed "good karma." Perhaps it's a bold marketing ploy to increase software sales among New Agers. Then again, maybe **Bill Gates** simply lost a bet.

Who can guess the source of inspiration? All we know is **Microsoft Network** (MSN) is now offering visitors to its new "Satori" Web site their very own personal "interactive journey of self-exploration and discovery."

Satori, we are told, is a **Zen Buddhist** term for sudden enlightenment. The goal of the site is to help users ask the question, "Who am I?" (The answer, of course, is another potential Microsoft customer.)

MSN's foray into the world of psycho-hustle is set up as a series of workshops in which different New Age gurus take a shot at selling you their old books and inspirational tapes, all set to background music apparently taken from a '70s porn film.

Satori was developed by a company called **Boxtop Interactive,** and who better to lead us on this journey of self-enlightenment than a Los Angeles-based Web site design firm that created Internet projects for **Major League Soccer, Fox Broadcasting** and the movie **Striptease?**

The site is located at http://satori.msn.com. One word of advice: Satori works better with Internet Explorer, so you **Netscape** users can just forget about full self-actualization.

'HEY, LIKE, WHERE'S THE ROOM WITH THE SONNY BONO MEMORABILIA?' If you're in the San Jose, Calif., area next Monday, you can drop by the **Fairmont Hotel** and become the proud owner of your very own Internet search engine.

WordCruncher Publishing Technologies is having an auction to sell its patented search technology to the highest bidder.

Officials of the Alpine, Utah-based company say its Web search engine is based on a dozen years of research at **Brigham Young University** and utilizes something called synchronous scrolling technology.

An exceptionally boastful message at the company's Web site (www.wordcruncher.com) vows that "the winning bidder will own [the Web search] market, practically overnight."

Considering the shaky profitability of most search engine companies, this strikes us as a dubious goal.

The auction is supposed to be restricted to invitees only, but we bet if you introduce the doorman to your good friend George Washington, he'll realize your name was inadvertently left off the guest list, if you know what we mean.

'Net Buzz was ready to submit a bid for WordCruncher — and Netscape, for that matter — only to discover that one of our seven chakras was out of balance. Help us realign by sending your best Internet- and intranet-related news. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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